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## 4.1

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### WAC 463-60-352 Built Environment—Environmental Health.

(1) Noise.

(2) *Risk of fire or explosion. The application shall describe any potential for fire or explosion during construction, operation, standby or nonuse, dismantling, or restoration of the facility and what measures will be made to mitigate any risk of fire or explosion.*

(3) *Releases or potential releases to the environment affecting public health, such as toxic or hazardous materials. The application shall describe any potential for release of toxic or hazardous materials to the environment and shall identify plans for complying with the federal Resource Conservation and Recovery Act and the state Dangerous waste regulations (chapter 173-303 WAC). The application shall describe the treatment or disposition of all solid or semisolid construction and operation wastes including spent fuel, ash, sludge, and bottoms, and show compliance with applicable state and local solid waste regulations.*

(4) *Safety standards compliance. The application shall identify all federal, state, and local health and safety standards which would normally be applicable to the construction and operation of a project of this nature and shall describe methods of compliance therewith.*

(5) *Radiation levels. For facilities which propose to release any radioactive materials, the application shall set forth information relating to radioactivity. Such information shall include background radiation levels of appropriate receptor media pertinent to the site. The application shall also describe the proposed radioactive waste treatment process, the anticipated release of radionuclides, their expected distribution and retention in the environment, the pathways which may become sources of radiation exposure, and projected resulting radiation doses to human populations. Other sources of radiation which may be associated with the project shall be described in all applications.*

(6) *Emergency plans. The application shall describe emergency plans which will be required to assure the public safety and environmental protection on and off the site in the event of a natural disaster or other major incident relating to or affecting the project as well as identifying the specific responsibilities that will be assumed by the applicant.*

[Statutory Authority: RCW 80.50.040 (1) and (12). 04-21-013, amended and recodified as § 463-60-352, filed 10/11/04, effective 11/11/04. Statutory Authority: RCW 80.50.040. 92-23-012, § 463-42-352, filed 11/6/92, effective 12/7/92.]

## **SECTION 4.1 ENVIRONMENTAL HEALTH (WAC 463-60-352)**

This Section 4.1 Environmental Health includes six (6) subparts: (1) Noise; (2) Risk of Fire or Explosion; (3) Releases or Potential Releases to the Environment Affecting Public Health; (4) Safety Standards Compliance; (5) Radiation Levels; and (6) Emergency Plans.

### **4.1.1 NOISE**

The Energy Facility Site Evaluation Council (EFSEC) is the lead state agency responsible for environmental permitting of energy facilities with a capacity of 350 megawatts (MW) or greater.

EFSEC rules mandate that energy facilities it permits must comply with the Washington State noise standards and also must assess the potential for impacts from low frequency noise. The Washington State noise standards identify overall A-weighted sound level limits but do not directly address low frequency noise or potential increases over existing ambient sound levels.

The proposed Pacific Mountain Energy Center (PMEC) facility is located across the Columbia River from the town of Prescott, Oregon and northeast of the former Trojan Nuclear plant. The estimated distance from the PMEC site to the Oregon side of the river is approximately 2,400 feet. Therefore, although not required, the Noise Impact Analysis also assesses the proposed facility's compliance with the Oregon noise standards. Similar to the Washington noise standards, the Oregon noise standards identify overall A-weighted sound level limits; however, also included are limits on specific octave band sound levels and on potential increases over ambient levels. Other noise impact guidelines used in the Noise Impact Analysis include the United States Environmental Protection Agency (EPA) guidance regarding overall sound levels and California guidelines regarding low frequency noise.

The Noise Impact Analysis determined that sound levels emitted from the PMEC would comply with both Washington and Oregon A-weighted noise limits and would not result in a significant increase in the existing noise environment. In the assessment of impacts from low frequency noise, predicted sound levels in the 31.5 hertz (Hz) octave band exceed Oregon's limit for this octave band but overall levels are lower than guidelines used in the State of California.

#### **4.1.1.1 Affected Environment**

##### **Introduction to Noise Technology**

The human ear responds to a very wide range of sound intensities. The decibel scale (dB) used to describe sound is a logarithmic rating system which accounts for the large differences in audible sound intensities. This scale accounts for the human perception of a doubling of loudness as an increase of 10 dB. Therefore, a 70-dB sound level will sound about twice as loud as a 60-dB sound level. People generally cannot detect differences of 1 dB. In ideal laboratory situations, differences of 2 or 3 dB can be detected by people, but such a change probably would not be noticed in a typical outdoor environment. A 5-dB change would probably be clearly perceived by most people under normal listening conditions.

As mentioned above, the decibel scale used to describe noise is logarithmic. On this scale, a doubling of sound-generating activity (i.e., a doubling of the sound energy) causes a 3-dB increase in average sound produced by that source, not a doubling of the loudness of the sound (which requires a 10-dB increase). For example, if traffic along a road is causing a 60 dB sound level at a nearby location, a doubling of the number of vehicles on this same road would cause the sound level at this same location to increase to 63 dB. Such an increase might not be discernible in a complex acoustical environment.

When addressing the effects of noise on people, it is necessary to consider the frequency response of the human ear, or those frequencies that people hear best. Sound measuring instruments are therefore often designed to “weight” sounds based on the way people hear. The frequency-weighting most often used to evaluate environmental noise is A-weighting because it best reflects how humans perceive sound. Measurements from instruments using this system are reported in “A-weighted decibels,” or dBA. Unless specified otherwise, noise levels are reported in A-weighted decibels.

Low frequency noise is characterized by noise levels at frequencies less than about 100 hertz (Hz). Noise at those frequencies can be annoying to some people even at relatively low levels. Some jurisdictions assess low frequency noise by limiting unweighted sound levels in the octave bands below 100 Hz, typically in the 31.5 and 63 Hz bands. Other jurisdictions assess low frequency noise by an alternative frequency weighting system, C-weighting, which does not reduce the level of low frequency noise as much as the A-weighting system and is better at describing very loud, low frequency sounds. Although low frequency sound is less audible to humans, C-weighting is often used to assess potential annoyance from structural rattling due to low frequency noise. Measurements from instruments using this system are reported in “C-weighted decibels” or dBC.

Distance from the source, the frequency of the sound, the absorbency of the intervening ground, obstructions, and duration of the noise-producing event all affect the transmission and perception of noise. The degree of the effect on perception also depends on who is listening (individual physiological and psychological factors) and on existing sound levels (background noise). Typical noise levels of familiar noise sources and activities are presented in Table 4.1-1.

**TABLE 4.1-1  
COMMON SOUND LEVELS/SOURCES AND SUBJECTIVE HUMAN RESPONSES**

Thresholds/ Noise Sources	Noise Level (dBA)	Subjective Evaluations	Possible Effects on Humans
Human Threshold of Pain Carrier jet takeoff (50 ft)	140	Deafening	Continuous exposure to levels above 70 can cause hearing loss in majority of population
Siren (100 ft) Loud rock band	130		
Jet takeoff (200 ft) Auto horn (3 ft)	120		
Chain saw Noisy snowmobile	110		
Lawn mower (3 ft) Noisy motorcycle (50 feet)	100	Very Loud	Speech Interference
Heavy truck (50 feet)	90		
Pneumatic drill (50 feet) Busy urban street, daytime	80	Loud	
Normal automobile at 50 mph Vacuum cleaner (3 ft)	70		
Large air conditioning unit (20 feet) Conversation (3 feet)	60	Moderate	Sleep Interference
Quiet residential area Light auto traffic (100 ft)	50		
Library Quiet home	40	Faint	
Soft whisper	30		
Slight rustling of leaves	20	Very Faint	
Broadcasting Studio	10		
Threshold of Human Hearing	0		

Note that both the subjective evaluations and the physiological responses are continuous without true threshold boundaries. Consequently, there are overlaps among categories of response that depend on the sensitivity of the noise receivers.

## Noise Standards

This evaluation includes noise criteria established by EFSEC, the State of Washington, the State of Oregon, and federal agencies.

### *Washington's Energy Facility Site Evaluation Council (EFSEC)*

Energy facilities seeking permits from EFSEC are subject to section 463-62-352 of the Washington Administrative Code (WAC 463-62-352). The code states that applications should:

- Describe and quantify the background noise environment that would be affected by the energy facility
- Identify and quantify the impact of noise emissions resulting from construction and operation of the energy facility, using appropriate state-of-the-art modeling techniques, and including impacts resulting from low frequency noise

- Identify local, state, and federal environmental noise impact guidelines
- Describe the mitigation measures to be implemented to satisfy WAC 463-62-030
- Describe the means the applicant proposes to employ to assure continued compliance with WAC 463-62-030

WAC 463-62-030 states that energy facilities shall meet the noise standards established in chapter 70.107 RCW, the Noise Control Act of 1974 as implemented in the requirements in 173-60 WAC. These requirements are described below.

### ***Washington State Standards***

EFSEC rules mandate that the PMEC shall comply with the noise standards established in the WAC 173-60. Cowlitz County also adopts the noise regulations as set forth in WAC 173-60. WAC 173-60 establishes maximum noise levels permissible in identified environments pursuant to chapter 70.107 RCW. The state noise limits are based on the Environmental Designation for Noise Abatement (EDNA) of the noise source and the receiving properties. EDNAs are designated by class where Class A generally corresponds to residential areas, Class B EDNAs to retail and commercial areas, and Class C EDNAs to industrial and agricultural areas. The class of a property is typically determined by its predominant land use. The noise limits for each land use classification are presented in Table 4.1- 2.

**TABLE 4.1- 2  
WASHINGTON MAXIMUM PERMISSIBLE SOUND LEVELS (DBA)**

EDNA of Noise Source	EDNA of Receiving Property		
	Class A <sup>1</sup> (Residential)	Class B (Commercial)	Class C (Industrial)
Class A	55/45	57	60
Class B	57/47	60	65
Class C	60/50	65	70
<sup>1</sup> Sound limits shall be reduced by 10 dBA between the hours of 10 p.m. and 7 a.m. at Class A EDNAs Source: WAC Chapter 173-60			

The noise limits presented in Table 4.1- 2 can be exceeded for certain periods of time: 5 dBA for no more than 15 minutes in any hour, 10 dBA for no more than 5 minutes of any hour, or 15 dBA for no more than 1.5 minutes of any hour. Sometimes these exceptions are described in terms of the percentage of time a certain level is exceeded. For example, L<sub>25</sub> represents a statistical sound level that is exceeded 25 percent of the time, or 15 minutes in an hour. Similarly, L<sub>8.33</sub> and L<sub>2.5</sub> are the sound levels that are exceeded 8.33 and 2.5 percent of the time, or 5 and 1.5 minutes in an hour, respectively. At no time can the allowable sound level be exceeded by more than 15 dBA, represented by the L<sub>max</sub>.

Because the noise generated by the PMEC would not vary significantly (i.e., there would rarely be short-term peaks), the allowances for short-term increases in the noise level limits would rarely apply. Thus, PMEC (a Class C source) may not generate a sound level (L<sub>25</sub>) exceeding 70 dBA at nearby Class C EDNAs (i.e., industrial properties) during daytime and nighttime hours.

At the nearest Class A EDNAs, noise generated by the plant would be limited to 60 dBA during daytime hours (7 a.m. to 10 p.m.) and 50 dBA during nighttime hours. Because the proposed P MEC would operate 24-hours per day, it must be designed to meet the 50 dBA nighttime limit at any Class A EDNAs.

Traffic on public roads, waterborne vessels, and railroad traffic are exempt from the applicable environmental noise limits. Construction activities are also exempt from the noise regulations during daytime hours.

### ***Oregon State Standards***

Chapter 350, Division 35 of the Oregon Administrative Rules (OAR 340-35) establishes statewide noise control regulations. OAR 240-35-035 identifies noise limits for new commercial and industrial uses on previously unused sites. The noise limits apply at “noise-sensitive property,” which is defined as “real property normally used for sleeping, or normally used as schools, churches, hospitals or public libraries.” Residences are the only noise-sensitive property identified in the project vicinity in the State of Oregon.

The noise limits in OAR 340-35-035 are presented as noise limits for the statistical levels L<sub>50</sub>, L<sub>10</sub>, and L<sub>1</sub> over any one-hour period, i.e., the sound levels exceeded 50%, 10%, and 1% of the time, respectively. Table 4.1- 3 displays the allowable hourly statistical noise levels for two time periods, between 7 a.m. and 10 p.m. (for protection of speech communication) and between 10 p.m. and 7 a.m. (for protection of sleep at night). Because the P MEC would operate 24-hours a day, the stricter nighttime noise limits between 10 p.m. and 7 a.m. are the most applicable to this noise assessment.

**TABLE 4.1- 3  
OREGON  
NEW INDUSTRIAL AND COMMERCIAL NOISE SOURCE STANDARDS (DBA)**

Statistical Level	Allowable Statistical Noise Levels in Any One Hour	
	7 a.m. - 10 p.m.	10 p.m. - 7 a.m.
L <sub>50</sub>	55	50
L <sub>10</sub>	60	55
L <sub>1</sub>	75	60
The L <sub>50</sub> , L <sub>10</sub> , and L <sub>1</sub> statistical noise descriptors are the sound levels exceeded 50%, 10%, and 1% of the time, respectively. Source: OAR 340-35-035		

In addition to the overall noise limits shown in Table 4.1-3, OAR 340-35-035(1)(B)(b) specifies that new noise sources located on previously unused sites should not increase the ambient L<sub>10</sub> or L<sub>50</sub> noise levels by more than 10 dBA in any one hour. The resulting ambient statistical noise levels shall include all noises generated or indirectly caused by or attributable to the new source, even those otherwise exempt from the Oregon noise limits.

Similar to the Washington State noise standards, traffic on public roads, railroad traffic and equipment, and construction activities are exempt from the noise regulations (per OAR 340-35-035(5)).

### ***U.S. Environmental Protection Agency***

Federal regulatory agencies use the equivalent sound level ( $L_{eq}$ ) and the day-night sound level ( $L_{dn}$ ) to evaluate noise impacts. The  $L_{eq}$  is the level of a constant sound that has the same sound energy as the actual fluctuating sound. As such, it can be considered an energy-average sound level. The  $L_{eq}$  is the basis for the principal quantity used to describe the total outdoor noise environment, the day-night sound level ( $L_{dn}$ ). The  $L_{dn}$  is a 24-hour  $L_{eq}$  with a 10-decibel penalty added to sound levels that occur between 10 p.m. and 7 a.m. in consideration of potential disturbance of people trying to sleep.

While the EPA has no regulations governing environmental noise, EPA has conducted extensive studies to identify the effects of certain sound levels on public health and welfare. The EPA “Levels Document” identifies sound levels “requisite to protect the public health and welfare with an adequate margin of safety” (U.S. EPA 1974). EPA specifies an  $L_{dn}$  of 55 dBA for outdoor areas where quiet is a basis for use. Partly because the cost or feasibility of achieving these noise levels was not taken into consideration, these levels have the effect of guidelines, not regulations or standards.

### ***Low Frequency Noise Limits and Guidelines***

A noise level limit of 70 C-weighted decibels or dBC (C-weighting as defined in Section 3.3.2.1) has been recommended in California to protect against impacts from low frequency noise.

Washington does not specify limits on low frequency noise or on sound levels in each octave band. In Oregon, sounds emitted by an industrial or commercial noise source may be regulated to ensure that no excessive levels of noise in a specific octave band are emitted. The state of Oregon noise regulation (OAR 340-035-0035) limits octave-band noise levels in the low-frequency 32 Hz and 64 Hz octave bands to 65 dB and 62 dB, respectively.

### **Existing Sound Levels**

To characterize the existing noise environment, sound levels were measured at three locations near the P MEC site at the Port of Kalama in April 2006. Three Larson Davis 820 Type I Integrated sound level meters were used to measure hourly sound levels over a multi-day period. The meters were field-calibrated prior to and immediately following the measurements. The microphones were placed on tripods in Larson Davis environmental shrouds about 5 feet above the ground and connected to the sound level meters with extension cables.

The sound level meters were placed at residential/sensitive locations anticipated to have the greatest potential noise impacts from the proposed plant. Although the meters were not attended for the entire measurement, noise sources were noted during setup and retrieval of the meters.

A summary of the sound level measurement results is displayed below in Table 4.1-4 and a brief description of the measurement location and contributing noise sources are included at the bottom of the table. Some of the noise descriptors captured for the Oregon measurement location differ from the Washington descriptors because Oregon's noise regulations use different descriptors. For example, Oregon noise regulations use the statistical descriptors L<sub>1</sub>, L<sub>10</sub>, and L<sub>50</sub> while Washington uses the statistical descriptors L<sub>2.5</sub>, L<sub>8.3</sub>, and L<sub>25</sub> in addition to the L<sub>max</sub>. Detailed information regarding the measured levels is included in Appendix D. Figure 4.1-1 displays the measurement locations.

**TABLE 4.1- 4**  
**RANGE OF MEASURED HOURLY SOUND LEVELS (DBA)**

<b>WA Location</b>		<b>Leq</b>	<b>Lmax</b>	<b>L2</b>	<b>L8</b>	<b>L25</b>	<b>Ldn</b>
SLM1	Day	62-67	71-87	66-71	64-69	63-67	69
	Night	61-66	69-79	65-72	63-69	62-67	
SLM2	Day	68-72	78-88	74-77	73-75	70-73	75
	Night	66-71	77-83	73-76	71-75	67-73	
WA Noise Limits		NA	75/65	70/60	65/55	60/50	NA
<b>OR Location</b>		<b>Leq</b>	<b>Lmax</b>	<b>L1</b>	<b>L10</b>	<b>L50</b>	<b>Ldn</b>
SLM3	Day	44-61	60-88	49-76	46-58	44-54	57
	Night	46-53	54-84	50-60	48-56	45-52	
OR Noise Limits		NA	NA	75/60	60/55	55/50	NA

Note: Daytime hours are defined as between 7 a.m. and 10 p.m.; nighttime hours between 10 p.m. and 7 a.m.

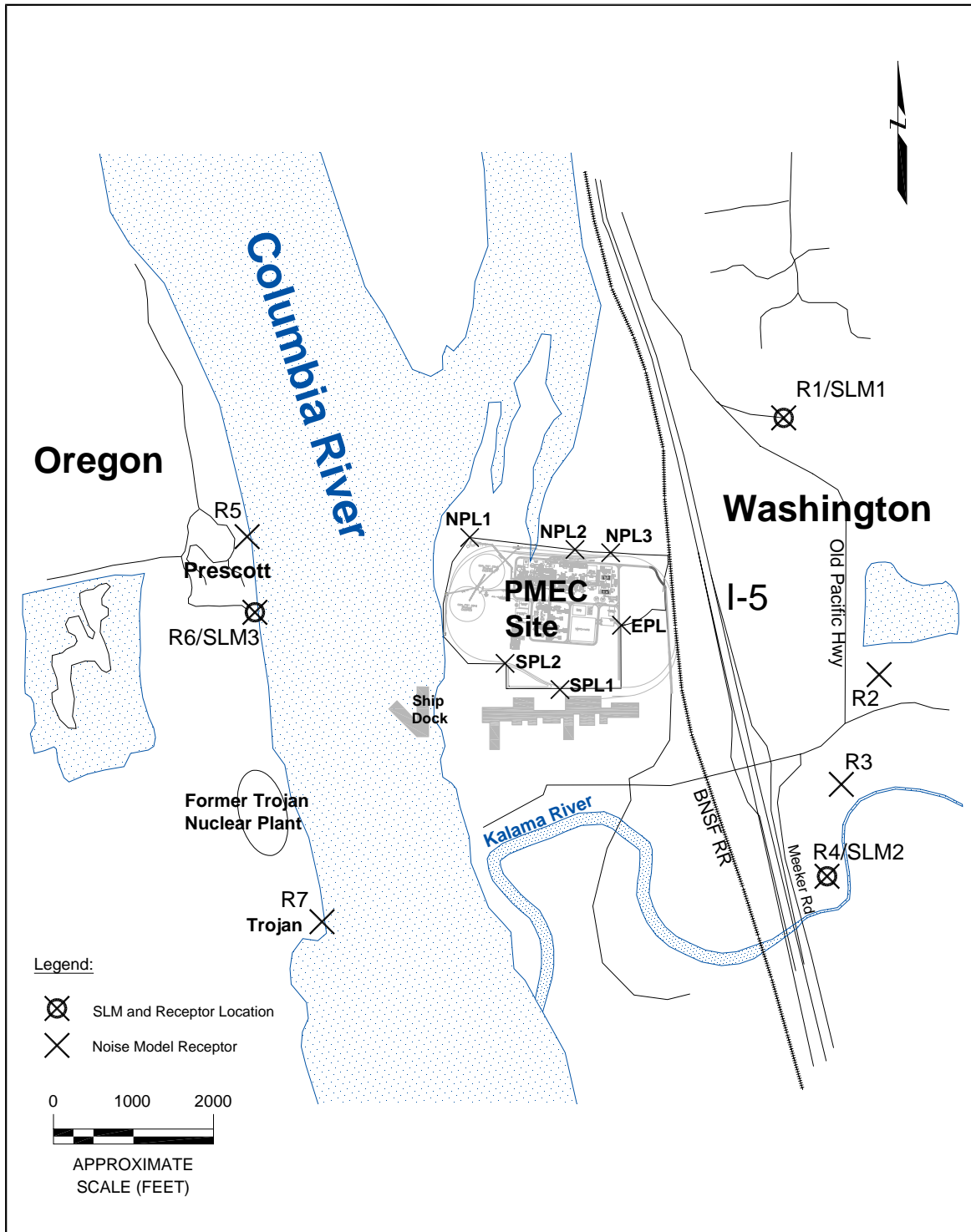
The Washington and Oregon noise limits are displayed as daytime/nighttime limits.

**SLM1:** This location was at a residence at 72 Bluff Road east of I-5 in Washington and overlooking I-5, the PMEC site, and the Columbia River. The dominant noise source at this location was traffic on I-5. Other sources included trains and localized residential activities.

**SLM2:** At Camp Kalama, located at 5055 N. Meeker Drive. This location represents a campground on the east side of I-5 in Washington. The PMEC site is not visible from this location due to intervening terrain and the structure of I-5. The dominant noise source at this location was traffic on I-5. Other sources included trains, traffic on Meeker Drive, and localized campground activities.

**SLM3:** Located at the residence at 33182 School Street in Prescott, Oregon. This residence is on the Columbia River and is directly across from the PMEC site. Background noise sources included traffic on I-5, occasional shipping activities on the Columbia River, and trains.

Source: Sound level measurements by Geomatrix Consultants, Inc., 2006



Source: Geomatrix

Figure 4.1 -1  
**SLM and Receptor Locations**  
Pacific Mountain Energy Center

#### 4.1.1.2 Impacts

##### Construction

###### *General Construction Activities*

During the construction phase of the PMEC, noise from construction activities could add to the noise environment in the immediate vicinity of the site. Typical sound levels associated with such activities are displayed in Table 4.1- 5.

**TABLE 4.1- 5  
TYPICAL CONSTRUCTION EQUIPMENT NOISE**

Activity	Type of Equipment	Range of Noise Levels (dBA)		
		At 100 Feet	At 2,500 Feet	At 5,000 Feet
Material Handling	Concrete Mixers	68-81	40-53	34-47
	Concrete Pumps	75-77	47-49	41-43
	Cranes	70-82	42-54	36-48
Stationary Equipment	Pumps	63-65	35-37	29-31
	Generators	65-76	37-48	31-42
	Compressors	70-81	42-53	36-47
Pile Driving	Drop Hammer	75-82	47-54	41-48
	Vibratory Hammer	60-89	32-61	26-55
	Auger Boring	71-77	43-49	37-43
Land Clearing	Bulldozer	71-90	43-62	37-56
	Dump Trucks	76-88	48-60	42-54
Grading	Scraper	74-87	46-59	40-53
	Bulldozer	71-90	43-62	37-56

Source: EPA, 1971, modified by Geomatrix Consultants, Inc., 2006

Based on the typical attenuation of sound over distance (6 dBA per doubling of distance), construction noise levels at the nearest residences to the site would generally meet the Oregon State daytime noise limits (i.e., 55 dBA) and the Washington State daytime noise limits (i.e., 60 dBA) for residential receivers.

Construction noise is exempt from the Washington state noise limits during daytime hours and from the Oregon state noise limits at all times. Also, the large distances between the plant site and the nearest residential receivers, the temporary nature of construction noise, and the presence of existing noise from I-5 at the residences in Washington, would serve to minimize potential noise impacts from PMEC construction activities.

###### *Steam Blows*

At the end of the construction process and prior to operation of the steam turbine, steam blows would be used to clean the steam piping of any dirt, debris, or rust accumulated during construction that could damage the turbine. This involves releasing high pressure steam through the piping system and venting it into the atmosphere. Steam blow sound levels are typically substantially louder than other construction activities, ranging from 117 to 128 dBA at a distance

of 100 feet. The nearest residence to the steam blow activity is approximately 3,500 feet away, across the Columbia River from the site. Several residences are within a mile of the plant. Sound levels at these residences could range from 86 to 97 dBA during each steam blow event. Sound levels in this range could be disruptive to nearby residents and to employees of neighboring industrial facilities. To minimize the short-term impacts, silencers providing at least 20 to 30 dBA of reduction could be installed on the piping vent.

## Operation

### *Noise Sources*

The PMEC would generate noise from a number of sources associated with fuel delivery and handling, the gasification process, and power generation. Some of these sources are relatively quiet compared with other sources, and these quieter sources would not be audible when the louder equipment is operating. Therefore, this evaluation focused on the loudest noise sources including the Air Separation Unit (ASU), Heat Recovery Steam Generators (HRSGs), steam turbines, exhaust stack, cooling towers, flare, and train deliveries. Much of the activities and equipment would be located in buildings or enclosures, which can greatly reduce the contribution of noise from these sources. Table 4.1- 6 summarizes the A-weighted sound pressure levels associated with the dominant noise sources examined in this assessment. Octave band sound power levels for each source are provided in Appendix D.

**TABLE 4.1- 6  
SUMMARY OF PMEC NOISE SOURCES**

Source	Data Source	# Units	Approximate Sound Pressure Level at 100 ft (dBA)
<b><i>Gasification Process</i></b>			
Air Separation Unit (ASU) Building	1	1	70
ASU Cooling Tower	2	1	71
ASU Cooling Tower Fan	4	7	64
ASU Cooling Tower Pumps	1	1	67
ASU Building stacks/exhaust	1	2	64
Vent Oxidizer (VO) Stack	1	1	64
Enclosed Flare	3	1	70 (Adjacent to windscreen, 15 feet from outside wall of flare. )
Sulfur Recovery Unit	1	2	68
SynGas Compressor	1	2	60
TailGas Compressor	1	1	64
SynGas Burner (Part of Tank Vent Oxidizer)	1	2	65
TailGas Burner (Part of Tank Vent Oxidizer)	1	1	65
Blowers	1	4	45 (or 85 dBA at 3 feet)

**TABLE 4.1-6 (CONTINUED)  
SUMMARY OF PMEC NOISE SOURCES**

Source	Data Source	# Units	Approximate Sound Pressure Level at 100 ft (dBA)
<b><i>Power Generation</i></b>			
Gas Turbine Exhaust Diffuser and Expansion Joint	2	2	70
HRSG Inlet Transition Duct	2	2	61
HRSG Wall	2	2	63
Stack Wall	2	2	42
Stack Exit	2	2	64
IP and LP Kettle Boilers	2	2	61
Gas Turbine Inlet Filter House	2	2	61
Gas Turbine Fuel Gas Systems	2	2	56
Gas Turbine Generator	2	2	56
Gas Turbine Lube Oil Package	2	2	64
Gas Turbine (in enclosure)	2	2	48
Steam Turbine	2	2	71
Steam Turbine Generator	2	2	57
Cooling Tower	2	1	71
Cooling Tower Fan	4	12	64
Recirc Water Pump	2	1	68
Boiler Feed Water Pump	2	6	68
Fuel Gas Conditioning Skid	2	2	65
Generator Step-up Transformer	2	4	67
Auxiliary Transformer	2	1	55
Steam Turbine Lube Oil Skid	2	2	64
Condenser	2	2	72
Condensate Pumps	2	2	62
<b><i>Material Delivery/Handling</i></b>			
Coal/Pet Coke and Flux Unloading (RR)	4	2	68
Slag and Sulfur Loading	4	2	61
Transfer Tower	1	1	57
Slurry Feed Building	1	1	54
Slurry Prep Building	1	1	54
Slag Handling Building	1	1	59
Rod Mill Building	1	1	59
Ship Unloading Crane	4	1	64
Locomotive	4	4	68

Sources:

- 1) Excelsior Energy Inc. Joint Permit Application for the Mesaba Energy Project, Environmental Supplement: Section Three, June 16, 2006
- 2) Siemens Westinghouse, personal communication, July 2006
- 3) John Zink Company LLC, personal communication, June 2006
- 4) Data taken from previous Geomatrix sound level measurements

Note: Please note that engineering and equipment selection has not been finalized and that the above equipment sound levels are speculative. They are used in this analysis to represent a reasonable estimate of overall future sound levels from the proposed facility.

**Gasification Process:** The loudest noise sources associated with the gasification process are large compressors required as part of the ASU. These would be housed in a building; and this analysis assumes that the walls and roof of the ASU building would be sufficient to meet the noise levels displayed in Table 4.1-6 and that any air intakes or vents would utilize appropriate silencers.

The sound level for the proposed enclosed flare is shown only for long-term, typical pilot flare operation. Sound levels during start-up conditions, expected to occur up to 12 times per year, would be somewhat louder. Maximum operation, which might be required during emergencies or major upset conditions, could be substantially louder but would rarely, if ever, occur.

Blowers were assumed to be located near the fuel unloading and slag loading areas and at the tank vent oxidizer.

**Combined Cycle Power Generation:** The noise impact analysis initially used base sound levels for the HRSG and HRSG exhaust stack that assumed virtually no mitigation. When initial noise calculations indicated mitigation may be warranted, a minimum level of mitigation was assumed for both.

For the HRSG, the sound levels used assumed the thickness of the steel in the HRSG would be increased over the base standard design. The HRSG inlet transition duct would be  $\frac{3}{4}$ " thick, the first half of the HRSG body walls  $\frac{1}{2}$ " thick, and the second half of the HRSG body  $\frac{1}{4}$ " thick. For the HRSG exhaust stack, the casing on the first half of the stack was assumed to be  $\frac{1}{2}$ " thick. Additionally, the noise analysis assumed that stack baffles would be installed, which would produce a 12-dBA noise reduction from the stack exit when compared to the stack exit with no baffles.

**Fuel Delivery, Handling, and Preparation:** Much of the fuel storage and handling would occur inside two storage domes. These domes would contain loaders, stackers, reclaimers, etc. This analysis assumed that the outer shell of the storage domes would substantially reduce the sound levels from these interior sources, so these sources were not quantitatively considered in this analysis. This analysis also assumed that the fans proposed for installation in the roofs of the domes would be large, slow fans and would produce negligible levels of noise in comparison to the other on-site noise sources.

This analysis assumed that the barge\ship unloading would use a low-noise bucket unloader. Trains delivering the fuel would consist of four locomotives pulling train cars with fuel material on a perimeter track at a constant speed of 0.3 mph. Each delivery could take up to five hours. This assessment considered train noise by estimating the worst-case one-hour sound level for each residence. This would generally be due to the four locomotives operating on that portion of the track (approximately 1,500 feet long) nearest to each residence.

### ***Cadna/A Noise Model***

Noise anticipated to be generated by operation of the PMEC was evaluated at nearby receivers using the Cadna/A noise model. Cadna/A is a computer program that calculates sound levels after considering the noise reductions or enhancements caused by distance, topography, ground surfaces (including water), atmospheric absorption, and meteorological conditions in compliance with ISO-9613-2:1996. The modeling includes the following steps: (1) characterizing the noise sources, (2) creating 3-dimensional maps of the site and vicinity to enable the model to evaluate effects of distance and topography on noise attenuation, and (3) assigning the equipment sound levels to appropriate locations on the site. Cadna/A then constructs topographic cross sections to calculate sound levels in the vicinity of a project site.

Using Cadna/A, sound levels resulting from the P MEC were predicted at seven residential or sensitive receivers in the general vicinity and six property line locations. Although there are no residential or sensitive receivers adjacent to or very near the proposed site (all are approximately 2,400 feet or further from the site), some of the nearest residences east of I-5 and west of the Columbia River were considered in the analysis.

### ***Predicted A-weighted Sound Levels at Residential Receiving Properties***

**Project-Related Sound Levels:** Table 4.1- 7 identifies predicted sound levels at the nearest residential/sensitive receiving properties to the proposed P MEC site. Predicted levels are shown both with and without railroad movement. Noise from railroad equipment and facilities is exempt from both the Washington and Oregon State noise limits. However, train noise is considered in order to assess the full potential impacts from the proposed P MEC facility. Both the “No Train” and “With Train” scenarios are displayed in Table 4.1-7. Table 4.1- 7 indicates that predicted sound levels with no train movement comply with the 50 dBA nighttime noise limit for industrial noise sources affecting residential receivers. With train movement noise, only one location, R6 in Prescott, Oregon across the Columbia River from the site, would experience sound levels exceeding 50 dBA, and the overall project-related sound level would still only be 51 dBA.

The calculated project-related daily sound levels ( $L_{dn}$ s) are at or below the 55-dBA guideline suggested by EPA for protection of residential uses, with or without inclusion of the train noise. It is important to note that the overall sound levels at all residential and sensitive receivers are currently greater than 55 dBA and would likely continue to exceed 55 dBA in the future, with or without P MEC.

**Sound Level Increases:** As shown in Table 4.1-7, with no train event the hourly sound level increases are all 5 dBA or less, with most locations experiencing virtually no increase in levels. The projected daily sound levels ( $L_{dn}$ s) would not increase at residential locations east of I-5 but potentially could increase by 1 to 2 dBA west of the Columbia River in Oregon. The hourly increases at all locations also are less than the 10 dBA increase stipulated in the Oregon State noise rules.

With train activity at P MEC, there is virtually no projected increase in either cumulative hourly or  $L_{dn}$  sound levels at the residences and sensitive receivers east of I-5, and no noise impacts would be expected. At residences in Oregon west of the Columbia River, the highest predicted hourly sound level increase of 8 dBA could be readily noticeable. However, the increase is below the 10-dBA increase limit stipulated in the Oregon State noise rules.

**TABLE 4.1- 7**  
**PROJECT AND CUMULATIVE SOUND LEVELS,**  
**HOURLY AND DAILY (DBA, L25/L50, LDN)**

Receptor	Existing Levels		No Train						With Train <sup>a</sup>					
	Hourly	Ldn	Project Only		Cumulative <sup>b</sup>		Increase		Project Only		Cumulative <sup>b</sup>		Increase	
			Hourly	Ldn	Hourly	Ldn	Hourly	Ldn	Hourly	Ldn	Hourly	Ldn	Hourly	Ldn
Washington Receptors <sup>c</sup>														
R1 (SLM1)	62-67	69	48	54	62-67	69	0	0	49	55	62-67	69	0	0
R2	62-67	69	45	51	62-67	69	0	0	47	52	62-67	69	0	0
R3	62-67	69	43	49	62-67	69	0	0	44	50	62-67	69	0	0
R4 (SLM2)	67-73	75	42	49	67-73	75	0	0	43	49	67-73	75	0	0
Oregon Receptors <sup>c</sup>														
R5	44-54	57	44	50	47-55	58	0-3	1	49	54	50-55	59	2-7	2
R6 (SLM3)	44-54	57	47	53	48-55	59	1-5	2	51 <sup>d</sup>	55	51-56	59	2-8	2
R7	44-54	57	46	52	48-55	58	1-4	1	47	53	49-55	58	1-5	1

<sup>a</sup> The Ldns were calculated assuming 5 hours of train noise during nighttime hours. The hourly sound levels shown are for those hours with a train.

<sup>b</sup> The cumulative sound levels include both the measured existing ambient sound levels and the predicted PMEC-related sound levels.

<sup>c</sup> The sound levels in Washington State are represented by the L25 noise descriptor; the sound levels in Oregon State are represented by the L50 noise descriptor.

<sup>d</sup> The shaded cell displays a sound level exceeding the 50-dBA nighttime noise limit. However, this includes noise from train movement noise, which is exempt from the applicable limits.

**R1:** At the same location as SLM1 on a bluff east of I-5 overlooking the freeway, the PMEC site, and the Columbia River. This receptor location represents several residences on this hillside.

**R2 and R3:** Representing residences east of I-5. The PMEC site is not visible from this location due to an intervening hill and the freeway.

**R4:** At the same location as SLM2 at Camp Kalama. This location represents a campground on the east side of I-5 in Washington, and the PMEC site is not visible from this location due to intervening terrain and the freeway.

**R5:** This receptor represents residences in Prescott, OR across the Columbia River from the PMEC site.

**R6:** Located at the same location as SLM3, at a residence in Prescott, OR across the Columbia River from the PMEC site.

**R7:** Located in Trojan, OR across the Columbia River to the southwest of the PMEC site.

### ***Predicted Sound Levels at Property Line Locations***

In addition to residential receivers, sound levels were calculated at several property line locations. Receptors were placed on the site's northern, eastern, and southern property lines. There are no developed properties to the north and there are no plans for properties to be developed there due to the high water concentration. The adjacent southern property is currently industrial in use and the nearest properties to the east comprise an industrial use, railroad, and a freeway. All properties would be considered industrial, or Class C, receivers with the least

stringent noise limits. Directly west of the P MEC site is the Columbia River, therefore no western property line sound level was considered.

Calculated sound levels at industrial property line receptors are shown in Table 4.1-8. The levels meet the Washington State noise limit for industrial sources affecting industrial receiving properties. The highest sound levels are along the northern and southern property lines near the cooling towers which are undeveloped or industrial. With train activity, the predicted sound levels are higher than the 70-dBA industrial noise limit. However, the train activity is exempt from the limits.

**TABLE 4.1- 8**  
**CALCULATED SOUND LEVELS, PROPERTY LINE LOCATIONS (DBA)**

Receptor	No Train <sup>a</sup>	With Train <sup>b</sup>
NPL1	62	64
NPL2	68	72
NPL3	67	73
EPL	64	64
SPL1	62	79
SPL2	67	74
WA Noise Limits	70	N/A <sup>b</sup>

<sup>a</sup> The No Train scenario is also representative of the scenario with Ship unloading.

<sup>b</sup> Noise from train movements are exempt from the Washington State noise limits. The levels are presented here for informational purposes only.

### ***Predicted Low Frequency Noise***

The P MEC is still in preliminary design, and final equipment has yet to be determined. Therefore, accurate estimates of low frequency noise associated with the major on-site equipment are not yet available. However, preliminary data provided by equipment manufacturers and published data of similar sources were used to estimate potential low frequency sound levels and overall C-weighted sound levels in order to assess the potential impacts from low frequency noise.

The primary sources of low frequency noise are anticipated to be:

- HRSG transition duct
- HRSG wall noise
- Gas Turbine Exhaust Diffuser and Expansion Joint
- Air Inlet Filter House
- HRSG Exhaust stacks
- Steam Turbine

- Enclosed Flare
- Cooling Tower
- Locomotives

Both the predicted C-weighted sound levels (dBC) and unweighted sound levels in the 31.5 and 63 Hz octave bands are displayed in Table 4.1- 9. As seen in the table, the estimated C-weighted sound levels with or without train activity is 70 dBC or lower, which would protect against undue impacts from low frequency noise. However, predicted sound levels in the 31.5 Hz octave band under with or without a train, and predicted sound levels in the 63 Hz octave band with a train, are shown to exceed the suggested Oregon limits for nighttime hours.

**TABLE 4.1- 9**  
**ESTIMATED LOW FREQUENCY SOUND LEVELS AT RESIDENTIAL RECEIVERS**

Receptor	No Train			With Train		
	dBC	31.5 Hz Octave Band	63 Hz Octave Band	dBC	31.5 Hz Octave Band	63 Hz Octave Band
<i>Washington State</i>						
R1 (SLM1)	66	68	59	67	68	61
R2	64	66	55	65	67	60
R3	64	67	54	65	67	57
R4 (SLM2)	64	66	54	64	66	56
<i>Oregon State</i>						
R5	65	67	59	68	68	64
R6 (SLM3)	68	70	61	70	71	65
R7	64	66	55	69	71	62
<i>Suggested Limits</i>	<i>70</i>	<i>65<sup>a</sup></i>	<i>62<sup>a</sup></i>	<i>70</i>	<i>65<sup>a</sup></i>	<i>62<sup>a</sup></i>

<sup>a</sup> The State of Oregon octave band noise limits for residential receiving locations between 10 p.m. and 7 a.m. Shaded cells indicate sound levels that exceed the suggested limits.

#### 4.1.1.3 Mitigation Measures

##### Construction

Construction would generally occur only during daytime hours to reduce the potential for noise impacts from this activity. Construction noise is exempt from both Washington and Oregon noise limits during daytime hours.

Although the temporary nature of construction and the restriction of construction to daytime hours would reduce the potential for noise impacts, steam blows occurring near the end of the construction period could produce levels of noise much higher than other typical construction noises. Silencers could be installed on the piping vents prior to steam blows to reduce the potential for impacts from this activity.

## **Operation**

Several measures have been included in the noise modeling analysis in order to meet the Washington State noise regulations or to reduce noise impacts based on suggested noise impact guidelines for low frequency noise.. The following measures that go beyond standard equipment designs have been assessed:

- Increased thickness of the steel walls of the HRSG sections and inlet transition duct
- Increased thickness of the stack walls
- Installation of sound baffles in the HRSG exhaust stacks to reduce noise from the stack exits
- Adequate design and construction of various enclosures and buildings on the site to achieve the sound levels displayed in Table 4.1-6. The exterior sound levels should include sound emitted through the roof and walls and any intake or vent openings

Although the noise modeling analysis indicated that the above mitigation would be necessary to meet the Washington State noise limits or suggested low frequency guidelines, the P MEC is still in preliminary design, and final equipment has yet to be determined. Therefore, accurate estimates of overall and low frequency noise associated with the major on-site equipment are not yet available. Final decisions on the appropriate noise mitigation for this site should not be made until the specific equipment proposed for the site has been selected and the design is in its final stages. During final design, ongoing consideration will be given to minimizing noise with appropriate design and equipment selection of the facility to assure compliance with applicable noise standards, ordinances, or guidelines. Particular attention will be given to minimizing sound levels in the low frequencies, particularly in the 31.5 and 63 Hz octave bands.

### **4.1.2 RISK OF FIRE OR EXPLOSION**

The discussion of the risk of fire or explosion at the P MEC is organized in three parts; risk during construction, risk during operation and mitigation of risk. Each part is further divided into a discussion of risk for the plant and a discussion of risk for the natural gas pipeline.

#### **4.1.2.1 Risk During Construction**

##### **P MEC Facility**

The risk of a significant fire or explosion during construction of the facility is considered to be extremely low. During construction small quantities of flammable liquids and compressed gases will be stored and used. Liquids will include construction equipment fuels, paints and cleaning solvents. Compressed gases will include acetylene, oxygen, helium, hydrogen and argon for welding. The potential hazards associated with these materials will be mitigated by following construction safety requirements found in Washington Administrative Code 296-155 and 29 CFR 1926 (OSHA).

## **Natural Gas Pipeline**

Generally the risk of fire or explosion during pipeline construction is minimal. Moving of soil and the welding of pipe are the primary tasks required. The risk of fire during welding will be mitigated through care taken in construction of the new pipeline. The contractor installing the new gas pipe shall be an organization familiar and experienced in performing this type of work. Active use of all the mitigating factors should drastically reduce the risk of fire or explosion.

The overall construction process for the pipeline includes the following steps. First the permanent and construction ROW is cleared and top soil is pushed to one side of the ROW. As the trench is excavated, the pipeline will be constructed in sections at the edge of the trench. After the welds are X-rayed, the pipe will be lowered into the trench using a series of side booms. There are tie-in welds performed in the trench that are X-rayed after the pipe is in the trench. Once the pipe is completed in the trench and backfilled with soil, it will be pressure tested with water. On-site inspectors representing the owner will be present during construction to verify that the contractor is following all engineering specifications and meeting all regulatory requirements.

Historically natural gas pipelines are an extremely safe means of transporting energy. Ground movement/mass wasting is one of the biggest hazards to buried natural gas pipelines. In this case, the ground is flat and stable, with only one potential bridge crossing, so this risk is minimal.

### **4.1.2.2 Risk During Operation**

#### **PMEC Facility**

Operation of the PMECC will require the use of, petroleum coke (petcoke), coal, or natural gas for fuel and ammonia for emission control. Petcoke and coal will be stored on site in two aluminum dome structures to ensure maximum control of fugitive dusts and noise emissions, and an enhanced visual appearance. The fuel storage basis will be a minimum of about 30 days of storage. Each of the domes will be furnished with two or more large overhead type doors for equipment access as well as two or more pass doors for personnel access. The upper dome areas will be furnished with low-speed fan powered ventilator units for control and exhaust of heat buildup. The ventilation units will be equipped with power-operated shut-off dampers and will be operated only after the air-borne dusts generated during stockout operations have settled out. The opened overhead doors will allow entry of fresh air to replace exhausted air.

The natural gas fuel will be piped directly to the facility, none will be stored on site. The emergency diesel generator fuel will be stored in a 1000-gallon above-ground double-walled tank. Smaller quantities of lubricating oils will be contained in the three turbine generator lubrication oil reservoirs and systems. Ammonia will be stored and used in an ammonia system that meets code requirements.

All of these materials and quantities are normal for this type of facility. The industry has many years of operation at many facilities with little history of explosions or fire. When explosions or fires occurred they resulted from equipment malfunctions or operator errors. During these

incidents flammable gases were released in an unsafe manner, either inside equipment or the work area. The combination of flammable gases ignition sources and oxygen resulted in explosions. As a result of these incidents, codes, regulations and consensus standards have been upgraded to reduce the likelihood of recurrences. These upgraded measures will be complied with during all phases of construction and operation.

## **Natural Gas Pipeline**

Natural gas pipelines are the only practical means of transporting and using natural gas. Pipelines are in use throughout the world. Various codes and regulations and industry standard designs define how natural gas pipelines are designed and operated. The large number of gas pipelines and large volumes of natural gas transported testify to the safety of the technology.

Historically natural gas pipelines are an extremely safe means of transporting energy. Ground movement/mass wasting is one of the biggest hazards to buried natural gas pipelines. In this case, the ground is flat and stable with only one potential bridge crossings, so this risk is minimal.

### **4.1.2.3 Risks During Standby**

Risks during standby are the same as the risks during operation. A power plant is a complex entity that must be maintained in the proper state to be useful. Standby is occasionally experienced due to low power demand. The plant and gasifiers must be capable of operation when required so all systems are kept in operation ready status during standby.

### **4.1.2.4 Risks During Dismantling**

Risk of dismantling a power plant and gasifiers are the same as those of dismantling any industrial facility. All gases must be removed utilizing the operating procedures. All liquids must be drained. Once the systems have been drained and purged with nitrogen they can be dismantled by conventional means.

### **4.1.2.5 Mitigation of Risk**

## **PMEC Facility**

The risk of fire or explosion at the PMECC will be mitigated by designing, constructing and operating the facility as required in the applicable codes approved by the local authority, regulations and consensus standards. A representative list of applicable codes and regulations is presented in Appendix D. Based on the timing of construction, the most current versions of the applicable codes and regulations will be utilized.

The combustion turbine generator units will be equipped with specialized fire detection and protection systems. Gas detectors will alarm when combustible gas in the combustion turbine unit enclosures reaches 25% of the Lower Explosive Limit (LEL). Should combustible gas concentration increase to 60% of LEL the gas detectors will shut down the combustion turbine, which results in closing the gas supply trip valve to the unit. The vent fans in the turbine

enclosure will help to clear the combustible gas out of the enclosure. Thermal fire detectors and smoke detectors are located throughout the combustion gas turbine generator enclosure. Excessive heat or smoke will trip the detectors which in turn will release a fire smothering gas or a dry fire extinguisher.

The Fire Protection System, including the fire water system, fixed suppression systems, detection systems, and portable fire extinguishers, will provide the required fire protection for the complex and will consist of the following major components:

- Dry pipe sprinkler system
- Wet pipe sprinkler system
- Yard loop hydrant system
- Preaction spray/sprinkler system for turbine generator bearings, lube oil equipment, gasifiers, air separation unit buildings, and fuel storage/transfer buildings and conveyors.
- High pressure CO<sub>2</sub> system for the control room
- Independent smoke detection system
- Portable fire extinguishers
- Standpipes and fire hose stations at various locations throughout the buildings
- Instrumentation and control equipment for alarm, indication of equipment status, and actuation of fire protection equipment
- Fire water storage tank
- Fire water pumps
- Preaction spray/sprinkler system for combustion turbine enclosure and electrical package

Fire water will be stored on-site, sufficient to provide maximum automatic sprinkler demand plus 500 gallons per minute for a two-hour period. The fire water pumping system will consist of a primary motor-driven pump, a diesel-driven backup pump with independent fuel supply, and a pressure-maintaining jockey pump. CO<sub>2</sub> and other suppression systems will be provided in areas where water systems will cause damage to plant equipment.

The lubrication oil system reservoirs will be equipped with fire detectors and a water deluge system which will be initiated automatically.

The diesel generator building will be equipped with fire detectors and an automatically operated deluge system.

The ammonia storage facility will be equipped with ammonia leakage detectors and an automatically initiated water deluge system to cool the ammonia storage tank. The entire ammonia system will be designed and built per the most current ammonia system codes.

Site fire water will be stored in an on site tank. A jockey pump will keep the fire system of hydrants and deluge systems pressurized. Upon operation of a deluge system or opening of a fire hydrant, the fire pumps will start to provide fire water as required.

The facility will be operated by qualified personnel using written procedures. Procedures will provide clear instructions for safely conducting activities involved in the initial startup, normal operations, temporary operations, normal shutdowns, emergency shutdowns and subsequent startups. The procedures for emergency shutdowns will include the conditions under which emergency shutdowns are required and the assignment of shutdown responsibilities to qualified operators to ensure that shutdowns are done in a safe and timely manner. Also covered in the procedures will be the consequences of operational deviations and the steps required to correct or avoid the deviations.

Before they are allowed to operate the facility, employees will be presented with a facility plan, including a Health and Safety Plan, and will receive training regarding the operating procedures and other requirements of safe operation of the plant. In addition, employees will receive annual refresher training, which will include testing of their understanding of the procedures. Training and testing records will be maintained.

## **Natural Gas Pipeline**

Causes of pipeline problems typically include ground movement/mass wasting, third-party damage, corrosion, and breaks at appurtenances. The route will be patrolled on a regular basis and checked by trained personnel (following a written qualification program as per 49 CFR Part 192) in order to catch these issues early before they become a problem. The following events are typical of those to be investigated and reported:

- Any evidence of a gas leak (dying or dead vegetation, odor)
- Actual or threatened ground movement
- Flooding or unusual erosion of roads, banks, easements, or rights-of-way
- Subsidence or cracking of land and paved surfaces
- Construction, land leveling, or excavation work by others on or adjacent to the pipeline
- Required maintenance on pipeline facilities, such as gates, fences, foot patrol roads, weed or brush removal
- Subdivision planning, surveying, or construction activity in the vicinity of the pipeline
- Missing or mutilated pipeline markers, or inadequately marked pipelines
- Evidence of gunshot damage or corrosion on exposed piping and components
- Evidence of vandalism
- Inoperative or damaged cathodic protection facilities

Monthly natural gas leak surveys will be performed by personnel walking the pipeline ROW directly above the pipeline, using appropriate natural gas instrumentation. Any time there is evidence of a natural gas leak, the individuals conducting the patrol shall use a combustible gas indicator (CGI) to determine ambient gas concentrations in the soil and air, and shall immediately notify the PMEC plant operators of the leak. The Emergency Response plan (see Section 4.6) will then be implemented.

The above ground natural gas pipeline facilities will be inspected weekly, monthly, and annually, and maintained according to the Operation and Maintenance Plan to meet or exceed all regulatory requirements.

Chances of the facility's gas pipeline failure are minimized by reducing the opportunities for failure. Pipeline appurtenances are limited to the fenced in valve station at the Deer Island Natural Gas Pressurization Station and within the fenced in areas of the plant site. The pipeline is buried in all other uncontrolled locations except for the potential suspension of the pipeline on the underneath side of the existing vehicular bridge across the Kalama River. Access to the pressurization station is fenced so it is unlikely a runaway vehicle could crash the fencing and cause damage to the facility. Pedestrian access is available only to authorized personnel. Pipeline appurtenances will be protected on the plant site by being contained within buildings or within immediate fenced-in areas. Bollards will be erected as required to ensure that on site vehicles are not able to reach critical areas. Access to critical areas will be limited to authorized personnel.

Main pipeline failure due to shifting of the supporting earth is unlikely since the pipeline route is over level ground. As discussed in Section 3.3.1.1, site soils are well-drained and very little runoff or signs of sheet and rill erosion were observed. This infers that the majority of site storm water currently infiltrates.

#### **4.1.3 RELEASES OR POTENTIAL RELEASES TO THE ENVIRONMENT AFFECTING PUBLIC HEALTH**

URS was retained by Energy Northwest to perform a Phase I Environmental Site Assessment (ESA) of the Proposed Pacific Mountain Energy Center property and facility located south of the intersection of Tradewinds and Eastwind Roads in Kalama, Washington (Figure 2.1-1). This property is currently owned by the Port of Kalama and has been used for placement of dredged river sediment, and subsequently as a sand quarry.

##### **4.1.3.1 Purpose and Scope of Work**

The purpose of the Phase I ESA was to assess, on the basis of readily available information, the following: (1) past and present land use practices and site operations; (2) the use, storage, generation, manufacture, and disposal of petroleum products and hazardous materials and wastes at the subject property; and (3) the potential presence of soil and groundwater contamination from on-site and off-site sources. This assessment was accomplished by, and limited to, a reconnaissance of the site, a drive-by survey of the site vicinity, a review of publicly available records, interviews of pertinent individuals and regulatory and public agency personnel, and a review of pertinent documentation currently and readily available from the current property

owners and through URS' standard information sources. The site vicinity is defined as the neighboring properties and facilities within an approximate distance of 1/4 mile of the subject property, the nature of which may adversely affect or have affected environmental conditions at the subject property due to the presence and/or release of hazardous substances or petroleum products to the environment.

The scope of work is in general accordance with the American Society for Testing and Materials (ASTM) standard practice for environmental site assessments (E 1527-00). Adherence to a particular financial or other institution's protocols or guidelines was not requested. URS' scope of services included the following elements:

- Review of pertinent, available documents and maps concerning local geologic and hydrogeologic conditions.
- Review and interpret available historical aerial photographs of the subject property vicinity for selected years back to 1940 or since initial site development, whichever is a greater period, from the Cowlitz County Tax Assessor's office and/or other readily available sources
- Review and interpretation of available archival topographic maps and historical land use maps (e.g., Metsker, Kroll, and Sanborn Fire Insurance maps) and business directories (e.g., Cole's and Polk's) of the subject property and the subject property vicinity for information about historical site land use that could have involved the manufacture, generation, use, storage and disposal of petroleum products and hazardous materials/wastes.
- Performance of a reconnaissance survey of the site to make visual observations of existing site conditions and activities.
- Review of current county, state, and federal lists of known or potential hazardous waste sites and landfills, and sites currently under investigation for environmental violations located within search distances of the subject property (ranging from the subject property itself up to a 1 mile radius as specified in ASTM E 1527-00) depending on the nature of the list reviewed, including:
  - EPA National Priorities ("Federal Superfund") List (1-mile radius)
  - EPA Delisted NPL List (1/2-mile radius)
  - EPA Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) and CERCLIS No Further Remedial Action Planned (NFRAP) Lists (1/2-mile radius)
  - EPA Emergency Response Notification System (ERNS) List (property)
  - EPA Resource Conservation and Recovery Act (RCRA) List (property and adjoining)
  - EPA RCRA Corrective Action (CORRACTS) Treatment, Storage, and Disposal (TSD) Facilities List (1-mile radius)
  - EPA Inventory of Open Dumps (1/2-mile radius) (USEPA 1985)
  - EPA Institutional and Engineering Controls databases (property and adjoining)
  - EPA Brownfields Sites
  - EPA Listing of Tribal Underground Storage Tanks (UST) Sites

- EPA Listing of Tribal Leaking Underground Storage Tank (LUST) Sites
  - Washington Department of Ecology (Ecology) Hazardous Waste Investigations and Toxics Cleanup Program—Confirmed and Suspected Contaminated Site Report List (1-mile radius)
  - Ecology Toxic Cleanup Program—Hazardous Sites List (1-mile radius)
  - Ecology LUST Sites List (1/2-mile radius)
  - Ecology Listing of Registered USTs (property and adjoining properties)
  - Ecology Institutional Controls Site List
  - Washington State List of Active Landfills (1/2-mile radius)
- Interview of City employees for information about the land use history of the subject property and past and present practices regarding use, storage, and disposal of petroleum products and hazardous materials and wastes.
  - Telephone inquiries and visits to relevant municipal, county, and state regulatory agencies and utilities as applicable for information about building or environmental permits, environmental violations or incidents, and status of enforcement actions at the site. Agency contacts included the following:
    - Cowlitz County Building Department
    - Cowlitz County Health Department
    - Cowlitz Fire District Number 5
  - Preparation of this subsection of the Application for Site Certification describing the research performed and presenting URS' findings, recommendations, and professional opinions about the potential for environmental contamination at the site.

#### **4.1.3.2 Site Location and Description**

##### **Site Location**




The subject property is located south of the intersection of Tradewinds and Eastwind Roads, Kalama, Cowlitz County, Washington (Figure 4.1-2). It is bounded on the north by Eastwind Road beyond which is an inlet from the Columbia River; to the east by an Air Liquide facility, wastewater treatment plant, Tradewinds Road, and railroad tracks across which is Interstate 5. The property is bounded to the south by Steelscape, Inc.; and on the west by the Columbia River. Land use in the site vicinity consists of manufacturing and agricultural usage.

##### **Site Description**

The subject property is comprised of approximately 95 acres, the majority of which is dredged river sand and sediment currently occupied by grass, moss, soil piles and a sand quarry at the above-mentioned location (Figure 4.1-2). Deposition of dredged river materials reportedly began in approximately 1978.



#### Legend

-  Water test well
-  Fence
-  Subject property

#### **4.1.3.3 Topography and Hydrogeology**

##### **Topographic Setting**

The subject property is located in the SE 1/4 of Section 36, Township 7 North, Range 2 West, Kalama, Cowlitz County, Washington. Topographic coverage of the site vicinity is provided by the U.S. Geological Survey, Kalama, Washington-Oregon, 7.5-minute series quadrangle, 1:24,000 series, dated 1990. The elevation at the subject property ranges from approximately 18 to 24 feet above Mean Sea Level. The nearest surface water features are the Columbia River and associated tidal flats adjacent to the west and northwest, and the Kalama River approximately 1,700 feet to the south (Figure 2.1-1). There is little topographic relief across the site.

##### **Hydrogeologic Setting**

The subject property is located along the east side of the Columbia River. The subsurface at the subject property is described according to boring logs from previous geotechnical reports and a groundwater monitoring investigation. The subject property at surface to a depth up to approximately 16 feet below ground surface (bgs) is composed of fill originating from dredged river sediment. This fill consists of fine to coarse grained brown sand with traces of silt. Beneath the fill are alluvial flood deposits that are composed of silt and clay with sand dominated interbeds. This flood deposit is reportedly underlain by claystone at depth. Regional bedrock in this region is composed of volcanic rocks of Mesozoic age.

The groundwater table has been encountered on the subject property at depths reported ranging from 10 to 20 feet bgs. Groundwater table elevations are strongly influenced by the present stage of the Columbia River, due to the subject property's proximal location to the Columbia River and associated tidal flats. Groundwater flow is also influenced by the Columbia River, and therefore, is inferred to be westerly.

#### **4.1.3.4 Site History and Land Use**

Information regarding historical land use of the subject property and adjacent properties was obtained by reviewing previous Phase I and II ESA reports, and by reviewing historical resources such as historical aerial photographs, archival topographic maps and historical land use maps.

##### **Previous Phase I Environmental Assessment Report**

A previous Phase I ESA was performed by Parametrix, Inc. in January 1995 (Parametrix, 1995). The Parametrix report summarized a Level I Environmental Site Assessment of the Port of Kalama North Port property. The "North Port" property included the subject property and the property adjacent to the south, currently occupied by the Steelscape facility. The report summarized a historical review, regulatory database and file review and a site reconnaissance.

Results of analytical testing of dredged river sediment conducted by the Port of Kalama in August of 1994 detected total volatile solids, oil and grease, and total metals above laboratory

detection limits. The concentrations of the contaminants were less than the applicable MTCA Cleanup Levels. PAHs, PCBs, or pesticides were not detected.

The report concluded no evidence of contamination was observed on, or documented at the property, and that no regulatory records of environmental concerns were identified pertaining to the property.

### **Previous Environmental Assessment Report**

A report was prepared by Hart Crowser dated February 1995 summarizing a Preliminary Environmental Site Assessment of the Port of Kalama North Port property (Hart Crowser, February 1995). The “North Port” property included the subject property and the property adjacent to the south, currently occupied by the Steelscape facility. The report concluded that indications of significant potential for adverse environmental conditions related to hazardous substances or petroleum products on the property were not identified.

### **Previous Baseline Assessment of Dredged Fill Sands Report**

Hart Crowser performed a Baseline Assessment of dredged fill materials deposited onto the subject property in March 1995 (Hart Crowser, March 1995). The report summarized sampling and analysis of fill material from six locations across the North Port property including at least three samples from the subject property. The samples were collected from five to seven feet below ground surface (bgs), and laboratory analyses included metals, PCBs, PAHs and pesticides. PCBs, PAHs and pesticides were not detected in samples analyzed. Metals were detected; however, none exceeded MTCA Method A Cleanup Levels.

### **Historical Resources Review by URS**

Historical resources reviewed by URS for this Phase I ESA include historical aerial photographs, archival topographic maps, historical land use maps (Kroll and Metsker), fire insurance maps (Sanborn), city directories, and other relevant documents obtained from the Cowlitz County Tax Assessor’s Office, City of Kalama Public Library, URS’ Seattle office library, and other sources.

Information reviewed includes the following documents:

- Historical aerial photographs dated 1984 and 1999
- Archival topographic maps dated 1940 (photorevised 1970) and 1990
- Metsker Atlas land ownership maps dated 1942, 1956, 1968 and 1980
- Polk City Directories dated 1940, 1946, 1950, 1955, 1960, 1965, 1970, 1975, 1979, 1985, 1990, 1996, 1998, 2002 and 2005. Although city directories for the subject property area dated between 1940 and 2005 were reviewed, the earliest directory to include coverage of the subject property or adjacent parcels was 1996

Sanborn Fire Insurance Maps were reviewed by EDR. Available maps did not provide coverage of the subject property.

For the purpose of evaluating the information reviewed as detailed in this section of the report, the presence or absence of "significant change(s)" noted during the review refers to changes in land use with the potential to adversely affect the environment with regard to the use, generation, storage, or disposal of hazardous substances or petroleum products. Examples of changes termed "significant" include the appearance of a building, the devegetation of land, and/or ownership of property by entities appearing commercial and/or industrial in nature. Details of historic findings are provided in the following table.

**TABLE 4.1-10  
HISTORIC FINDINGS**

<b>Date</b>	<b>Location</b>	<b>Observation</b>	<b>Source</b>
1940	Subject Property	Subject property is illustrated as vegetation covered. No development is indicated on the subject property.	Topographic Map
	Adjacent	The railroad track is oriented generally north to south along its current footprint. The Steelscape facility, Eastwind and Tradewinds Roads and I-5 are not yet illustrated.	
1942	Subject Property	Subject property is labeled as owned by the Northern Pacific Railway. No development is indicated on the subject property.	Metsker Map
	Adjacent	The Northern Pacific Railway track is oriented generally north to south along its current footprint. The path of I-5 is illustrated to the east and is labeled "proposed super highway".	
1956	Subject Property	The Northern Pacific Railway ownership label remains on the west portion of the subject property. An unimproved road is illustrated as crossing the subject property with a SW to NE orientation. A Weyerhaeuser Timber Co. right-of-way (possibly a road or path) crosses the north portion of the subject property	Metsker Map
	Adjacent	"Borrow Pit" is shown adjacent and east of the subject property. I-5 is illustrated in its current position.	
1968	Subject Property	Pages are missing from map book.	Metsker Map
	Adjacent	Pages are missing from map book.	
1970	Subject Property	The subject property is shown to contain little to no slope. An unimproved road is illustrated as crossing the east side of the subject property in a north to south orientation. Several trails are depicted across the subject property in a north to south orientation. A tidal flat is illustrated on the north portion of the subject property that is no longer there. The railway and I-5 are shown to the east in their current position.	Topographic Map
	Adjacent	Drays Mound is illustrated to the east with its peak at 120 feet tall. Several tidal flats are illustrated which are not currently where they were.	

**Table 4.1-10 (Continued)**  
**Historic Findings**

Date	Location	Observation	Source
1980	Subject Property	No significant changes are evident	Metsker Map
	Adjacent	Railway now labeled Burlington Northern and is adjacent to the east. "Drays Mound" is adjacent to the east. "Merz Road" is indicated as crossing I-5 and the parcel adjacent to and south of the subject property.	
1984	Subject Property	The east portion of the property is illustrated as primarily covered with short vegetation, the west portion appears to have very little vegetation, possibly regraded sand. An apparent drainage crosses the west portion of the property. An apparent road is present in the approximate alignment of the west end and west portion of the north portion of the present day Tradewinds Road. The east or northeast portions of Tradewinds Road are not apparent. An apparent dirt surface road traces the approximate alignment of the present day Eastwind Road. Kalama River Road extends north along the west boundary of the property to meet Tradewinds Road. Other development on the property was not apparent.  The northwest portion of the property has a light cover of vegetation, possibly indicative of fairly recent deposition or grading of this area. Standing water extends into the north portion of the property similar to the present day.	Aerial Photo
	Adjacent	Property adjacent to the north and north portion to the east are similar to the present day, including dense vegetation to the north, and the railroad tracks to the east. Neither Air Liquide nor the WWTP are present east of the south portion of the property. Steelscape is not present to the south, nor the North Port wharf to the southwest. Kalama River Road is apparent to the south and I-5 to the east.	
1990	Subject Property	The tidal flat on the north portion of the subject property is no longer illustrated.	Topographic Map
	Adjacent	Several tidal flats previously illustrated to the south are no longer illustrated.	
1990	Subject Property	Significant changes not noted	Polk City Directory
	Adjacent	Significant changes not noted	
1996	Subject Property	Site not listed in directory.	Polk City Directory
	Adjacent	Kalama River Road is listed in the area east of I-5. Mentions intersection with Merz Road.	
1998	Subject Property	Site not listed in directory.	Polk City Directory
	Adjacent	BHP Coated Steel Corp. is listed.	
1999	Subject Property	The subject property and adjoining properties are in configuration similar to that observed during our site visit, except less vegetation covers the property. Tradewinds and Eastwind Roads are in configuration similar to that observed during our site visit.	Aerial Photo
	Adjacent	The main buildings of Steelscape are present to the south, and the North Port wharf is present to the southwest. The finished product storage building that in the present day is closest to the southwest portion of the property, is not yet present.	

**Table 4.1-10 (Continued)**  
**Historic Findings**

<b>Date</b>	<b>Location</b>	<b>Observation</b>	<b>Source</b>
2002	Subject Property	Site not listed in directory.	Polk City Directory
	Adjacent	BHP Coated Steel Corp. is listed at 222 West Kalama River Road.	
2005	Subject Property	Site not listed in directory.	Polk City Directory
	Adjacent	Steelscape steel mills is listed at 222 West Kalama River Road.	

The earliest resource reviewed, a 1940 topographic map, depicted the property as primarily covered with vegetation. A land ownership map dated 1942 indicates that the subject property was owned by Northern Pacific Railway, and the map did not indicate development specific to the subject property. A 1984 aerial photograph indicated that portions of the property void of vegetation indicating likely deposition of dredge fill materials. Between 1947 and the present, changes on the subject property consisted of some clearing of vegetation, placement of dredged material, the addition of several unimproved roads and trails, and the addition of one paved road.

The Northern Railway is illustrated in its current position as early as 1940. I-5 is first shown east of the railroad in 1956. Several tidal flats were identified on adjacent properties prior to 1990. A 1990 Topographic Map depicts these tidal flats as having been filled in. The buildings on the Steelscape property are first observed on a 1999 aerial photograph, to the south of the subject property. The North Port wharf is also present in this photograph to the southwest of the subject property.

According to the Port of Kalama representative, an unknown, but believed to be very small, quantity of soils was deposited to the property generated by grading operations associated with Cowlitz County road projects. The specific locations to where these soils were deposited are not known, and the projects were reportedly screened by the Port of Kalama to avoid deposition of contaminated materials.

Historical sources that would have depicted the property as undeveloped were not reasonably ascertainable during the attempt to trace the subject property history to first development. Therefore, URS is unable to confirm whether livestock grazing and/or deposition of materials dredged from the river represent the first developed use of the property.

#### **4.1.3.5 Site Observations**

Mr. Mark Wilson of the Port of Kalama accompanied URS during URS' site reconnaissance and provided information on the operations and history of the property, information regarding hazardous substances, and documentation regarding dredged materials deposition.

#### **General Conditions**

The majority of the subject property is occupied by materials dredged from the adjacent Columbia River, short vegetation, a sand and gravel quarry and access driveways. The west approximately 1/3 of the property was dredged materials from the eruption of Mt. St. Helens in 1980, and the remaining was dredged river sediment. Mr. Wilson indicated the dredged materials on the property are up to approximately fifteen feet thick. Use of chemicals at the

property space was not observed. Eastwind and Tradewinds roads provide access to the property.

An area of the north portion of the property was covered by dense vegetation thereby limiting the visual assessment. One brush and stump pile observed on the northwest portion of the property included a small amount of paper, beverage cans, plywood and plastic. Several piles of soil were observed on the southwest portion of the property. Staining or suspicious odors that would have indicated releases of petroleum products or hazardous substances in the area of the brush or soil piles were not observed.

The northwest portion of the property has been used as a sand quarry. At the time of URS' site reconnaissance, this area was being regraded, including movement of sand across the property. The northwest portion of the property includes an area lower in elevation, that included standing water believed to be a result of drainage of the subject property and surrounding area. Oily sheens, residue or other indications of contaminants were not noted in the water in this ditch.

### **Utilities**

The subject property is supplied with electricity by Cowlitz Public Utilities District (PUD). Potable water supply, sanitary and storm sewer services are not connected to the property at this time. Although natural gas is not currently connected to the property, Cascade Natural Gas is the local provider of natural gas.

### **Aboveground and Underground Storage Tanks**

No aboveground storage tanks were observed at the subject property. Fill access covers or vent pipes were not observed that would have indicated presence of underground fuel oil storage tanks (USTs) at the property.

### **Hazardous Substances and Petroleum Products**

Hazardous substance storage or uses were not observed at this property, and operations that would have generated hazardous wastes were not observed. Significant stains or suspicious odors were not observed that would have indicated release of hazardous substances to the subject property.

### **Drains and Sumps**

Floor drains, sumps, subgrade containment areas, or trench drains were not observed or reported at the subject property.

### **Polychlorinated Biphenyls**

One pad-mounted transformer was observed on the northeast portion of the subject property adjacent to Tradewinds Road. Labels indicating "No PCB's" were not observed on the transformer however, the Port of Kalama representative reported that the transformer was installed in 2005. The transformer is owned by the Cowlitz County PUD, and based on the

reported installation date, it is unlikely that the transformer is PCB-containing. Staining or other evidence of release from this transformer was not observed.

Additional dielectric or hydraulic fluid containing equipment such as elevators or large capacitors was not observed or reported at the site.

## **Water Supply and Wells**

The subject property is reportedly not currently connected to the City of Kalama municipal water supply, however a water supply pipeline reportedly passes beneath the subject property. Two groundwater wells installed by the Port were observed along the north portion of the subject property. The test wells were reportedly used for conducting pump tests to ascertain the recharge of the aquifer for potential use by the proposed PMEC. URS reviewed Ecology's files for wells in the site vicinity and there is no record of monitoring or potable supply wells at this location.

## **Wastewater and Storm Water**

Current sources of wastewater for this property were not identified. The site is relatively flat with little topographical relief, and due to the permeability of the site surface soils, storm water is primarily absorbed into the site soils. Stains or oily sheens that would have indicated releases to the subject property were not observed.

## **Pits, Ponds and Lagoons**

Standing water was observed in two areas lower in elevation on the northwest portion of the property. The water appeared to be ponded storm water or river water, and sheens or suspicious odors were not noted that would have indicated releases of petroleum products or hazardous substances. Pits, ponds or lagoons associated with hazardous materials or wastes were not observed at the subject property.

### **4.1.3.6 Neighboring Properties**

The property is bounded to the south by a driveway beyond which is the Steelscape coiled metals production facility, reportedly constructed in approximately 1996 /1997. The facility operations reportedly include import of rolled steel stock, further rolling of steel, and surface alteration of steel including etching and water-based painting. The facility includes a driveway, railroad spur, and several apparent chemical and wastewater storage tanks. Stained or discolored surfaces were not observed that would have indicated releases from the tanks or Steelscape operations.

The subject property is bounded to the west by the Columbia River. There are rolls of coiled steel, and a storage building leased by Steelscape and reportedly utilized for storage and office space adjacent to the southwest corner. Oily sheens or staining were not observed adjacent to the coils of steel stored adjacent to the property. The property is bordered to the north by a vegetation covered area reportedly also historically formed by deposition of dredged river materials. The property is bounded to the east by Tradewinds Road, an Air Liquide facility and a Port of Kalama wastewater treatment plant (WWTP). The WWTP reportedly treats domestic

sewage from the Steelscape facility. Beyond Tradewinds Road is a vegetation covered area beyond which is a set of railroad tracks utilized for freight and passenger service. Bulk storage of petroleum products or hazardous substances was not observed on site-adjacent areas of neighboring properties that are adjacent to the PMEC site.

A pipeline reportedly used to convey gases from the Air Liquide facility passes on or adjacent to the south boundary of the property. Although a representative of Air Liquide was not available for interview, gases conveyed are believed by the Port of Kalama representative to be hydrogen, nitrogen and oxygen. Pump stations or other appurtenances typically associated with hazardous substances were not observed.

Other current land uses which are considered to have a potential to affect the environmental conditions of the subject property were not observed on the adjacent properties. As observed from the subject property boundaries, there was no visual evidence of releases of hazardous materials/wastes from operations at the adjoining properties.

#### **4.1.3.7 Agency Database Review**

A review of applicable regulatory agency documents and lists of known or potential hazardous waste sites or landfills, and properties or facilities currently under investigation for potential environmental violations was conducted to identify properties or facilities located within a search distance of up to one mile of the subject property that may have the potential to adversely affect environmental conditions at the subject property. The following EPA and agency documents and lists were reviewed for the search distances specified in ASTM E1527-00 at a minimum. Environmental Data Resources, Inc. (EDR) of Southport, Connecticut provided this information from a computerized database search for the subject property and sites in the vicinity of the subject property (See Appendix E. Information is on file at EFSEC's offices.) For the purpose of addressing the relative location of a facility to the subject property, URS has inferred the groundwater flow direction to the west toward the Columbia River based on topographical relief and surface drainage. A listing and description of the databases searched and number of sites confirmed to be located within the applicable radii are summarized as follows:

**TABLE 4.1-11  
AGENCY DATABASE REVIEW**

<b>Type of Database</b>	<b>Description of Database/Effective Date</b>	<b>Radius Searched</b>	<b>Number of Sites Identified</b>
National Priorities List (NPL)	The USEPA NPL identifies uncontrolled or abandoned hazardous waste sites. To appear on the NPL, sites must have met or surpassed a predetermined hazard ranking system score, been chosen as a state's top priority site, pose a significant health or environmental threat, or be a site where the EPA has determined that remedial action is more cost-effective than removal action.	1 mile	0
Delisted NPL List	The EPA Delisted NPL database identifies NPL sites that have been delisted when "no further response is appropriate" under the Superfund program.	0.5 mile	0
Corrective Action (CORRACTS) List	The EPA CORRACTS database identifies hazardous waste handlers with Resource Conservation & Recovery Act (RCRA) Corrective Action activity.	1 mile	0
Federal RCRA treatment, storage, or disposal (TSD) sites	RCRA TSD sites	0.5 mile	0
Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS)/No Further Remedial Action Planned (NFRAP)	The CERCLIS database identifies hazardous waste sites that require investigation and possible remedial action to mitigate potential negative impacts on human health or the environment. CERCLIS NFRAP sites are also included.	Subject Site and Adjoining Property (0.25 mile)	0
Federal RCRA Generators	RCRA-regulated hazardous waste generator notifier list; both large quantity generators (LQG) and small quantity generators (SQG) are included in this list.	Subject Site and Adjoining Property (0.25 mile)	2 (LQG) 0 (SQG)
Federal Emergency Response Notification System (ERNS)	EPA's ERNS list contains reported spill records of oil and hazardous substances.	Subject Site and Adjoining Property (0.25 mile)	0
Federal institutional and engineering controls databases	EPA's listing of sites with engineering or institutional controls in place.	Subject Site and Adjoining Property (0.25 mile)	0
Federal Brownfields Sites	Sites identified by the EPA as addressed by Targeted Brownfield Assessments and as recipients of Brownfields Cleanup Revolving Loan Fund (BCRLF) cooperative agreements.	0.5 mile	0
State solid waste disposal and landfill (SWLF/LF)	State inventory of solid waste disposal and landfill sites.	0.5 mile	0
State hazardous waste sites (SHWS), in Washington – Confirmed & Suspected Contaminated Sites List (CSCSL)	SWHS records are the states equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds are identified along with where cleanup will be paid for by potentially responsible parties.	1 mile	0

**Table 4.1-11 (Continued)**  
**Agency Database Review**

<b>Type of Database</b>	<b>Description of Database/Effective Date</b>	<b>Radius Searched</b>	<b>Number of Sites Identified</b>
State leaking underground storage tanks (LUST)	List of information pertaining to all reported LUST.	0.5 mile	0
State underground storage tank (UST)	State UST sites listing.	Subject Site and Adjoining Property (0.25 mile)	0
Independent Cleanup Report (ICR)	These are State remedial action reports given by owners or operators of sites. These actions are conducted under department oversight or approval and are not under an order or decree. This database is no longer updated.	0.5 mile	0
Unmapped "Orphan" sites	Sites that have not been plotted on a map, based on lack of sufficient data regarding their exact location within the general area.	-	34

The subject property was not identified in the databases reviewed.

Two sites identified by the database review (EDR ID #s 1 and 2) were in positions inferred to be adjacent and cross-gradient of the subject property and details of these sites are as follows:

- MG Industries, identified at 185 E Wind RD (EDR ID#1) was identified on the FINDS, CA HAZNET, and RCRA-LQG databases. Due to the lack of violations on the site and the cross-gradient orientation to the subject property, the potential is considered to be low that this site has impacted environmental conditions at the subject property.
- Steelscape, Inc., identified at 222 W Kalama River RD (EDR ID#2) was identified on the FINDS and RCRA-LQG databases. During 1999 and 2000, the property received general generator violations. No releases were indicated, but due to the nature of operations, there is potential for this site to have affected environmental conditions on the subject property. It did not appear on the list of confirmed or suspected contaminated sites.

URS reviewed the Unmapped Sites, which are sites that have not been geocoded based on lack of sufficient data regarding their exact location within the general area. The review of the Unmapped Sites did not identify properties which are likely to have adversely affected the subject property environment.

### **Agency Contacts**

The agencies and other entities contacted for information related to the subject and surrounding properties included the Cowlitz County Fire District #5, Cowlitz County Health Department, and the Cowlitz County Building Department. Telephone or email inquiries were made for information regarding building permits, underground storage tanks, environmental violation or incidents, and/or the status of enforcement actions at the subject property. Presented below is a listing of the various public agencies contacted and a summary of relevant findings.

- **Cowlitz County Building Department**

The Cowlitz County Building Department was contacted for information regarding the potential presence of current or former USTs on the subject property and activities potentially associated with closure. A representative from the building department reported that the only record in the possession of the county is a dredge re-handling permit. Mr. Sheldon Somers reported that the Army Corps of Engineers tested the dredge materials for hazardous materials prior to re-handling at the site. Results of the testing were not provided for URS' review or obtained as part of this ESA.

- **Cowlitz County Health Department**

The Cowlitz County Health Department did not possess records other than the dredge re-handling permit referenced by the Building Department.

- **Cowlitz Fire District #5**

The Cowlitz Fire Chief District #5 was contacted for information pertaining to hazardous materials or USTs on the subject property. Chief Leatzow informed URS that they know of no hazardous materials or USTs at the subject property.

#### **4.1.3.8 Findings and Conclusions**

Based on the visual observations and information presented in this report, URS presents the following findings and conclusions regarding the PMEC property proposed for development of an integrated gasification combined cycle plant located at the intersection of Tradewinds and Eastwind Roads, Kalama, Cowlitz County, Washington.

#### **Subject Property**

Direct evidence or information suggesting that the subject property environment has been adversely affected by current or past onsite use, storage, handling and/or disposal practices involving hazardous materials/petroleum products was not observed or obtained by this ESA. Potential concerns regarding the subject property were not identified with the exception of the following:

- Development of the property has been limited to possible agricultural operations, believed to be livestock grazing, and since the early 1980s, deposition of materials dredged from the adjacent Columbia River by the Corps of Engineers. Documentation of sampling and analysis of the dredged materials did not identify petroleum products or hazardous substances in concentrations exceeding MTCA Cleanup Levels. Groundwater sampling data was not reviewed, however, based on the lack of contaminants in the soils, there is not reason to suspect groundwater contamination.
- A small quantity of fill was also deposited at the property which is believed to have been generated by grading operations associated with Cowlitz County road projects. The specific source of these soils is not known. However, the projects were

reportedly screened by the Port of Kalama to avoid filling the site with contaminated materials.

### **Property Vicinity**

Direct evidence or information that the subject property environment has been adversely affected by current or past offsite use, storage, handling and/or disposal practices involving hazardous materials/wastes or petroleum products was not observed or obtained during URS' reconnaissance and agency database review. Specific conclusions are:

- The adjacent Steelscape and MG Industries facilities were identified by the database review report as Large Quantity Generators of hazardous wastes, and were observed with aboveground storage tanks exterior to the building. However, the facilities were not identified on lists of confirmed or suspected contaminated sites.
- The adjacent railroad tracks, wastewater treatment plant and Air Liquide facility have the potential to have adversely affected environmental conditions at the subject property. However, evidence of releases was not observed during the site reconnaissance, and these facilities were not identified on the government databases reviewed.

#### **4.1.3.9 Mitigation Measures**

The following mitigation measures will be included in the construction procedures to minimize the risk of potential releases to the environment:

- Soils will be screened for environmental contaminants during geotechnical investigations (borings or test pits) conducted within the footprint of the proposed building.
- If impacted soils are encountered during excavation, they will be tested and either treated or disposed of in accordance with MCTA standards.
- Contractors involved with utility installation and site earthwork will be made aware of the potential that some of the dredged soils underlying the site may require special handling and disposal if contamination is noted.

#### **4.1.4 SAFETY STANDARDS COMPLIANCE**

Energy Northwest and its contractors will comply with applicable local, state and federal safety, health and environmental regulations. The following are some of the primary standards that will be used in the design, construction and operation of the P MEC. A more detailed listing of codes and standards is provided in Appendix E.

- American Society of Mechanical Engineers, Boiler and Pressure Vessel Code
- API 5L, Line Pipe
- NFPA 850 Electric Generating Plants
- National and State Electrical Codes
- OSHA (WISHA), 29 CFR 1910.95 and 1926.52 (Occupational Noise Exposure)

- Uniform Building and Fire Codes
- American National Standards
- WAC 173-60-040, Department of Ecology Noise Regulations and WAC 296-62-09015 to 09055 Part K.

#### **4.1.4.1 Environmental Management System (EMS)**

Energy Northwest is committed to protecting the environment for current and future generations. As part of that commitment, we have implemented an Environmental Management System (EMS), which includes planning for P MEC and will include P MEC construction and operation. An EMS is a systematic approach to managing environmental hazards and potential impacts. It helps identify potential environmental risks and prevent negative impacts by putting necessary controls and programs in place. An EMS reduces risk while improving efficiency and effectiveness. Energy Northwest has received certification by an accredited registrar to the international ISO 14001 EMS standard. Energy Northwest has issued an environmental policy and has strengthened existing environmental protection programs and procedures to further integrate environmental stewardship into everything we do. Energy Northwest's Environmental Stewardship Policy expressly states: "We will provide energy services in a manner that responsibly balances the environment and social factors and business needs. We will foster a culture of environmental stewardship, promoting consideration of the environment by all employees in everything they do." The environmental stewardship policy also includes commitments to continual improvement, environmental compliance, pollution prevention, and communication about our environmental programs and performance to our employees, members, regulators, the community, and our customers.

#### **4.1.5 RADIATION LEVELS**

The proposed project is not expected to use or release any radioactive materials during operation. During construction there will be a minor, controlled use of radiation. This will consist of X-rays of pipeline welds. Minor controlled use of radiation will be by qualified personnel and in accordance with state and federal standards.

#### **4.1.6 EMERGENCY PLANS**

The Emergency Plan for Pacific Mountain Energy Center (P MEC) will consider the actions and responsibilities of Energy Northwest personnel and off-site assistance groups during situations that may require physical corrective actions. The plan will include procedures designed to outline preventive measures for specific conditions that could evolve into an emergency situation, and outline procedural methods for mitigating an emergency should one occur.

The fundamental objective of the plan is to provide the necessary prearrangements, directions, and organizational structure such that all plant emergencies can be effectively and efficiently resolved to safeguard the public, plant personnel, and property.

In all instances associated with this Plan, the P MEC Plant Manager, or designee, will be responsible for taking immediate action to safeguard the public, plant personnel, the

environment, and equipment. The protection of personnel, the public, and the environment will always take precedence; plant systems and equipment will be secondary. In any situation the more conservative approach will always be considered.

#### **4.1.6.1 Responsibility and Authority**

The PMEC will be staffed with at least one on-site Plant Manager. Off-site, the PMEC is supported by the PMEC Project Manager under the auspices of O&M Services, Corporate Regulatory Services, and Corporate Safety.

The responsibility and authority for day-to-day operations of the plant will be delegated to the PMEC Plant Manager and, as such, the Plant Manager will have direct responsibility to ensure that all routine and emergency site operations are conducted in a manner to protect the public, the environment, personnel and equipment. Overall responsibility and authority shall remain with the Plant Manager, or designee. The Plant Manager will ensure implementation and compliance with the Plan and component procedures, direct emergency response actions, account for personnel, and direct evacuation actions as appropriate.

The individual employee will be responsible for staying knowledgeable of the general guidance provided in the Emergency Plan and its component procedures, for actively participating in drills and training in support of the Plan and procedures, and for complying with policies set forth in the Plan and procedures. Each employee is responsible for notifying the Plant Manager of any potentially dangerous situation of which he or she has knowledge, and of any emergency situation (e.g., fire, oil spill, vehicle accident). The Plant Manager will notify the PMEC Project Manager and others as necessary to comply with the Plan and procedures.

Industrial Safety, Emergency Planning, and Regulatory Services personnel will assist PMEC staff as requested on maintaining and implementing this Plan and component procedures.

#### **4.1.6.2 Component Procedures**

The following procedures will be components of the Emergency Plan.

- Fire Plan
- Personal Injury Response Plan.
- Safety Plan
- Stormwater Pollution Prevention Plan
- Spill Prevention, Control and Countermeasure Plan
- Hazardous Waste Management Plan

#### ***Other Emergency Situations***

**Meteorological:** This type of emergency includes hail, high winds, thunderstorms, extreme cold weather, and any other naturally occurring weather situation that may endanger PMEC personnel, equipment, or require adjustments to the normal operations of the PMEC. Depending

upon the specific hazard, and available information, it is the responsibility of the Plant Manager or his designee to take the appropriate action to safeguard the public, the environment, plant personnel, the plant and its equipment.

**Geological:** This type of emergency deals with seismic activity and related geological phenomena. Depending upon the specific details available it is the responsibility of the Plant Manager or his designee to take the appropriate action to safeguard the public, the environment, plant personnel, the plant and its equipment.

**Man-Made:** This type of emergency includes bomb threats, civil unrest, sabotage, or any other man made threats to the PMEC or personnel working at the PMEC. This type of emergency must first be validated using the following criteria:

- Source of the information,
- Reliability of the information, and
- Ability to confirm the information.

Once the information has been validated then the decision must be made whether it will impact the PMEC or not. Once the decision is made, it is the responsibility of the Plant Manager or his designee to take the appropriate action to protect the public, the environment, plant personnel, the plant and its equipment, or to limit the impact on these elements.

The Plant Manager will coordinate response actions with the Cowlitz County Sheriff's office, Port of Kalama and PMEC personnel, and provide support as requested and available.

**Equipment Failure:** This type of emergency is primarily failure of equipment that may result in hazards to personnel.

#### **4.1.6.3 Reporting Requirements to the Energy Facility Site Evaluation Council**

Conditions affecting the safety of the PMEC, including any condition, event, or action at the PMEC that might compromise the safety, stability, or integrity of any facility or the ability of any equipment to function safely; or that might otherwise adversely affect the life, health, or property should be reported to the Energy Facility Site Evaluation Council (EFSEC).

Any condition affecting the safety of the PMEC should be reported orally to the EFSEC Contact by the Plant Manager as soon as practicable after that condition is discovered. A written report will be submitted to EFSEC within the time specified by the EFSEC, and must contain any information EFSEC directs, including:

1. The causes of the condition;
2. A description of any unusual occurrences or operating circumstances preceding the condition;
3. An account of any measure taken to prevent worsening of the condition;
4. A detailed description of any damage to the PMEC and the status of any repair;
5. A detailed description of any personal injuries;

6. A detailed description of the nature and extent of any private property damage;
7. Any other relevant information requested by EFSEC.

#### **4.1.6.4 Review and Updating**

The Emergency Plan will be reviewed annually, and changes made during the annual review or anytime a significant change has occurred in the information contained in this plan. The PMEC Plant Manager is responsible for scheduling the annual review and having the plan and procedures updated as needed. The procedures shall also be reviewed and revised as necessary, to reflect lessons learned from accidents, emergency situations, and tests of the procedures.

#### **4.1.6.5 Training and Drills**

Training of site personnel involved in emergency plan procedures shall be performed annually and shall be documented. Training will include a review of procedures, definitions, and regulations. All new employees will receive training as part of their orientation. Staff shall periodically test emergency plan procedures by either performing a table top drill or where practicable a field drill. If necessary, as a result of the drill(s), procedures shall be revised to take advantage of lessons learned.

#### **4.1.6.6 Agreements Related to Emergency Planning**

Prior to construction of the PMEC, agreements related to emergency planning will be developed with Cowlitz County and the Port of Kalama. These agreements will be provided to EFSEC and attached to the Emergency Plan prior to implementation.

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## 4.2

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### WAC 463-60-362 Built environment—Land and shoreline use.

- (1) The application shall identify land use plans and zoning ordinances applicable to the project site.*
- (2) Light and glare. The application shall describe the impact of light and glare from construction and operation and shall describe the measures to be taken in order to eliminate or lessen this impact.*
- (3) Aesthetics. The application shall describe the aesthetic impact of the proposed energy facility and associated facilities and any alteration of surrounding terrain. The presentation will show the location and design of the facilities relative to the physical features of the site in a way that will show how the installation will appear relative to its surroundings. The applicant shall describe the procedures to be utilized to restore or enhance the landscape disturbed during construction (to include temporary roads).*
- (4) Recreation. The application shall list all recreational sites within the area affected by construction and operation of the facility and shall then describe how each will be impacted by construction and operation.*
- (5) Historic and cultural preservation. The application shall coordinate with and provide a list of all historical and archaeological sites within the area affected by construction and operation of the facility to the Washington state office of archaeology and historic preservation and interested tribe(s).*
- (6) Agricultural crops/animals. The application shall identify all agricultural crops and animals which could be affected by construction and/or operation of the facility and any operations, discharges, or' wastes which could impact the adjoining agricultural community.*

[Statutory Authority: RCW 80.50.040 (1) and (12). 04-21-013, amended and recodified as § 463-60-362, filed 10/11/04, effective 11/11/04. Statutory Authority: RCW 80.50.040. 92-23-012, § 463-42-362, filed 11/6/92, effective 12/7/92.]

## **SECTION 4.2 LAND AND SHORELINE USE (WAC 463-60-362)**

This section addresses the land and shoreline use issues applicable to the proposed PMEC, including the following subsections:

- Land Use (Section 4.2.1)
- Relationship to Existing Land Use Plans and Policies (Section 4.2.2)
- Light and Glare (Section 4.2.3)
- Aesthetics (Section 4.2.4)
- Recreation (Section 4.2.5)
- Historic and Cultural Preservation (Section 4.2.6)
- Agricultural Crops/Animals (Section 4.2.7)

### **4.2.1 LAND USE**

#### **4.2.1.1 Existing Land Uses and Zoning**

##### **PMEC Site**

The PMEC would be constructed within the North Port Marine Industrial Park at the Port of Kalama. The Port of Kalama is designated heavy industrial and is located north of the City of Kalama, within Cowlitz County, Washington. The development site is located on the east bank of the Columbia River. The Burlington Northern Santa Fe (BNSF) rail lines lie immediately to the east of the site, between the site and Interstate-5 (I-5). The rail lines are contracted for use by BNSF, Union Pacific (UP) and Amtrak. The site can be accessed from I-5 via exit 32. Please see Figure 2.1-1 for a general vicinity map and Figure 2.1-2 for the development site map.

The approximately 95-acre site has access to a dock on a 43 ft deep draft Columbia River which is permitted to be expanded to approximately 1600 feet in length. The Kalama River flows into the Columbia River approximately 1700 feet to the south of the site but is separated from the site by Steelscape, a steel coil processing facility.

Properties adjacent to the development site are owned by the Port of Kalama and operated by lease holders. Energy Northwest would lease the development site from the Port of Kalama.

Land uses within and adjacent to the development site are unzoned but designated heavy industrial in the Cowlitz County Comprehensive Plan. Uses are listed below:

- North: service road (Eastwinds Road) and a forested site containing an undevelopable backwater channel of the Columbia River.

- South: local service road extension of Tradewinds Road, Steelscape, and the Kalama River. The Port of Kalama extends between the Columbia River and I-5 for 7 miles to the south.
- East: local service road, Tradewinds Road, wetland, BNSF\UP Railroads, large treed rock formation, and Interstate 5.
- West: Port of Kalama river front property for Port activities, dock, the Columbia River and across the river the community of Prescott, the decommissioned Trojan Nuclear Plant and forested areas.

There is limited space in the immediate vicinity for further development; however, development may include manufacturing and processing companies that could use energy generated by the PMEC facility.

### **Land Uses Within 25 Miles of the Site**

The area encompassing the 25-mile radius of the site is transected north-south by the Washington-Oregon boarder, the Columbia River, I-5, and BNSF Railway. East of the I-5 corridor, land use is predominantly forestry, with some agriculture, and residential uses in numerous unincorporated communities. The incorporated City of Kalama is approximately 2.5 miles south of the site. The Cowlitz County seat of Kelso and the City of Longview are about 7 miles north along the Columbia River. The incorporated cities of Castle Rock and Woodland are 17 miles north and 12 miles south respectively. The incorporated cities have mixed urban uses. Most of Cowlitz County is unzoned.

To the west across the Columbia River in Oregon, land use is mostly agriculture and forestry. The unincorporated community of Prescott, Oregon (population 73, U.S. Census Bureau, 2005 Population Estimates) is on the opposite bank of the Columbia River from the plant site. St. Helens is the closest incorporated city in Oregon, 14 miles to the south. To the east, the predominant natural features are the rivers draining from Mount St. Helens into the Columbia River, including the Toutle River (and Silver Lake), the Coweeman River, the Kalama River, and the Lewis River. Recreation facilities in the vicinity of the development are discussed below in Section 4.2.4.

### **Electrical Transmission Route**

Electricity generated by PMEC would be transmitted to the Bonneville Power Administration regional power grid utilizing Cowlitz County Public Utility District (PUD) lines. Cowlitz PUD will construct approximately 12 miles of new transmission lines within the PUD's existing transmission line right-of-way. The proposed transmission line route is outside the scope of this proposal.

### **Pipeline Route**

The proposed natural gas pipeline would be approximately 4 miles in length and would extend from the plant site south to the Deer Island Natural Gas Pressurization Station near Exit 27 on the west side of I-5 (see Figure 2.1-1). The gas pipeline would be located within existing pipeline

right-of-way and would be directionally drilled under the Kalama River or hung on the Hendrickson Drive bridge over the Kalama, then follow the dike/walking path along the Kalama River until it meets up with Hendrickson Drive. The pipeline would be located within Port land and under or along side Hendrickson Drive. The adjacent land use is predominantly industrial, with some recreational use including parkland and a marina. The pipeline would be constructed through a portion of the City of Kalama designated as an industrial area.

## **Railroad Spur**

One or more rail sidings or spurs will be needed to connect the PMEC rail loop to the BNSF/UP rail line (Figure 2.1-3). These spurs would likely be at 16 to 20-foot track centers and would be constructed within the present rail right-of-way, requiring modifications to the existing rail spurs servicing the Steelscape plant. The loop track and siding track will consist of about 11,300 lineal feet for the loop (turnout on mainline, around the site, to loop closure) and about 4,500 feet of sidings for non-feed stock shipping and receiving, resulting in a total of about 15,800 lineal feet of new railroad track. The loop track would ring the development site. A wetland immediately to the east would be filled in order to accommodate the tracks. See Section 3.5 for more information on wetland impacts.

### **4.2.1.2 Relationship to Existing Land Use Plans and Policies**

The proposed PMEC site is located within Cowlitz County. The subject property is regulated based on compliance with the Cowlitz County Comprehensive Plan and Zoning Regulations, Cowlitz County Critical Areas Ordinance, Cowlitz County Shoreline Management Plan, and the Cowlitz County Floodplain Management Plan. The natural gas pipeline alignment would be located primarily within Cowlitz County, with a portion located within the boundaries of the City of Kalama designated as an industrial area. Land use in the City is regulated based on compliance with the City of Kalama Comprehensive Plan and Zoning Regulations, the City of Kalama Critical Areas Protection Ordinance, the City of Kalama Shoreline Management Program and, the City of Kalama Floodplain Management Ordinance.

Under the State Growth Management Act (GMA), the County and cities within the County are required to adopt critical areas and natural resource land regulations. Cowlitz County is not required to fully plan under the GMA and has chosen not to do so. Therefore, the City of Kalama is not subject to most GMA requirements, with the exception of protection of critical areas and ensuring plan/regulation consistency. As an energy facility, the PMEC is regulated by the state Energy Facility Site Evaluation Council (EFSEC).

Land use plans directly applicable to the proposed site are:

- Cowlitz County

Cowlitz County Comprehensive Plan (November 6, 1976)

Cowlitz County Code

Chapter 16.10, Gas and Oil Pipelines (March 12, 1971)

Chapter 16.25, Floodplain Management Ordinance (June 22, 1987)

Chapter 16.30, Public and Private Utility Franchise (August 8, 1977)

Chapter 18.10, Land Use Ordinance (January 20, 1998)  
Chapter 19.15, Critical Areas Ordinance (February 9, 1998)  
Chapter 19.20, Shoreline Master Program (1977)

- City of Kalama

City of Kalama Comprehensive Plan (December 7, 2005)  
City of Kalama Municipal Code (last updated January 19, 2005)  
Title 17, Zoning Regulations  
Chapter 14.16, Floodplain Management Ordinance  
Chapter 15.02, Critical Areas Protection Ordinance  
Chapter 15.08, Shoreline Master Program

A discussion of the relationship of the development to the relevant plans, policies and regulations follows.

### **Cowlitz County Comprehensive Plan**

The Cowlitz County Comprehensive Plan was adopted by the Board of County Commissioners on November 1, 1976. The PMEC, railroad spur, and natural gas pipeline all lie within County jurisdiction. The Comprehensive Plan includes the following relevant goals and policies:

#### ***Non-Renewable Resources***

GOAL: To provide for the conservation and wise use of non-renewable energy, mineral resources, and unique natural features.

Policy 1. The County should, with the assistance of landowners, resource developers, and governmental agencies, identify and protect for future development, energy, minerals, and building material resources.

#### ***Industrial Classification***

In areas classified as heavy industrial, power generating facilities are a recommended use subject to special approval. The proposed development would be consistent with the Comprehensive Plan.

### **Cowlitz County Code, Chapter 16.10 Gas and Oil Pipelines**

Gas pipelines are regulated by Chapters 16.10 Gas and Oil Pipelines.

Gas pipelines constructed through Cowlitz County are subject to review for compliance with the Cowlitz County Code (CCC). A general permit issued by the Board of County Commissioners would be required as well as a roadway crossing permit for each roadway crossing (CCC 16.10.020 and 16.10.060).

As a permitted use, the proposed facility, railroad spur, and natural gas pipeline would be consistent with the Cowlitz County Land Use Ordinance.

## **Cowlitz County Code, Chapter 16.25 Floodplain Management**

The site development and railroad spur are not within the 100-year floodplain of the Columbia River. Portions of the natural gas pipeline would be within the 100-year floodplain of the Columbia and Kalama Rivers. The County Administrator is responsible for determining the extent of the floodplain. This determination is based on the Federal Emergency Management Agency (FEMA) flood insurance study and Flood Insurance Rate Maps. All developments within the floodplain require a floodplain management permit and to comply with development standards outlined in CCC 16.25.080 and 16.25.090.

## **Cowlitz County Code, Chapter 16.30 Public and Private Utility Franchises**

A short section of the natural gas pipeline would travel under or in the right-of-way of a Cowlitz County road. This section would be considered a franchise utility and a permit from the County Engineer would be required.

## **Cowlitz County Code, Title 18 Land Use and Development**

The Cowlitz County Land Use Ordinance contains zoning regulations and is found in Chapter 18.10 of the CCC. The proposed development site, railroad spur, and sections of gas pipeline within Cowlitz County are located on lands that are unzoned. As the site is unzoned, all activities are permitted.

## **Cowlitz County Code, Chapter 19.15, Critical Areas**

The Current Critical Areas Ordinance (CAO) is dated June 24, 1996. Cowlitz County will update their CAO pursuant to the State GMA by December 1, 2006. Under the GMA the County and cities within the County are required to adopt critical areas and natural resource land regulations. Critical areas in Cowlitz County are wetlands, aquifer recharge areas, geologically hazardous areas, fish and wildlife habitat, and frequently flooded areas.

The eastern half of the proposed site lies within critical areas designated by the CAO. There are wetlands, aquifer recharge areas, and fish and wildlife habitat conservation areas within the borders of the site, primarily at the edges of the property. The proposed natural gas pipeline and railroad spur also cross wetlands, aquifer recharge areas, fish and wildlife habitat conservation areas, and frequently flooded areas. Refer to Sections 3.4 and 3.5 for more details.

A critical areas permit would be required as the proposed development is located within a critical area. For wetlands, development limitations and corresponding mitigation is dependant on the wetland classification. The fish and wildlife habitat conservation areas are also wetlands, and therefore, the more stringent wetland regulations would apply. All development within designated frequently flooded areas shall comply with the Cowlitz County Floodplain Management Ordinance, Chapter 16.25 CCC. Refer to Sections 3.4 and 3.5 for more details.

## **Cowlitz County Shoreline Master Program**

Cowlitz County's Shoreline Master Program (SMP) was adopted in 1977. This program was adopted pursuant to the State Shoreline Management Act of 1971, and governs activities within designated shorelines. Shorelines are lands within 200 feet of the ordinary high water mark, or within the 100-year floodplain of designated shorelines. Portions of the proposed site and natural gas pipeline and railroad spur are within 200 feet of the Columbia River and/or the Kalama River. The proposed natural gas pipeline would be directionally drilled under the Kalama River or hung along the Hendrickson Drive bridge. The construction equipment would not disturb the river bed, its banks or its associated wetlands. Gas pipeline design, construction, testing, monitoring, maintenance and training measures are adequately addressed in the WUTC and U.S. DOT pipeline safety regulations. This development would require a shoreline substantial development permit (CCC 19.20). Chapter 19.20 of the CCC contains the Shoreline Management section.

The proposed plant site and the natural gas pipeline are within shoreline areas categorized as Urban Districts. Urban Districts are shoreline areas suitable for intensive recreation, residential, industrial, and commercial development. The objective of this district is to satisfy the socioeconomic needs of the present and future population of the county. As the proposed plant, natural gas pipeline, and railroad spur are within this Urban District they would be consistent with the SMP.

## **City of Kalama Comprehensive Plan**

The City of Kalama Comprehensive Plan was adopted on December 7, 2005. The natural gas pipeline would pass through the City of Kalama, through land designated as Industrial as well as industrial lands with a Public/Quasi Public overlay. Currently, there are no specific standards and regulations for the Public/Quasi Public designation. Industrial zoning would continue in this area consistent with the Comprehensive Plan. The City has a commercial/industrial development policy to “work closely with the Port of Kalama to ensure that industrial zoning and other land use classifications are compatible with Port of Kalama goals, activities and future plans.” There are no specific policies limiting the siting of power generation facilities or associated infrastructure in the City of Kalama Comprehensive Plan.

The Environmental element of the Comprehensive Plan includes a discussion of critical areas. As required by GMA (RCW 36.70A.170) the City of Kalama has adopted ordinances to designate and classify critical areas. Portions of the natural gas pipeline would be located in fish and wildlife conservation areas, and areas designated by the City of Kalama as frequently flooded areas, and critical aquifer recharge areas which are regulated by Chapters 14.16 and 15.02 of the Floodplain Management and Critical Areas Protection Ordinances respectively. For more detailed information refer to discussion below under “City of Kalama Municipal Code, Chapter 14.16, Floodplain Management Ordinance” and “City of Kalama Municipal Code, Chapter 15.02, Critical Areas Protection Ordinance”.

## **City of Kalama Municipal Code, Title 17 Zoning Regulations**

Zoning in the City of Kalama is shown in Figure 4.2-1. The City of Kalama Municipal Code (KMC) defines permitted uses in the Industrial zoning district, including:

- B. Buildings and developments necessary for the operation of a public utility.

The KMC does not specifically discuss gas pipelines. The City of Kalama has determined that the natural gas pipeline falls within the foregoing definition and is a permitted use in the Industrial zoning district. As such, a conditional use permit is not required.

## **City of Kalama Municipal Code, Chapter 14.16, Floodplain Management Ordinance**

All lands identified in the FEMA Flood Insurance Rate Map (Panel #530289 0001 A) that include lands within the 100-year floodplain are designated as frequently flooded areas. The City of Kalama also completed and adopted a Comprehensive Flood Hazard Management Plan (CFHMP) in 1999. The CFHMP analyzed the causes and possible solutions to the downtown flooding problem. There is no statutory requirement that Kalama prepare a CFHMP, and there is no legal authority vested within a CFHMP. Frequently flooded areas are regulated through Chapter 14.16 of the KMC.

A portion of the natural gas pipeline alignment would be within a frequently flooded area of the Columbia River within City of Kalama jurisdiction. A floodplain management permit pursuant to KMC 14.16.160 would be required.

## **City of Kalama Municipal Code, Chapter 15.02, Critical Areas Protection Ordinance**

The KMC was adopted by the Kalama City Council on June 2, 2004. Critical areas include wetlands, aquifer recharge areas, geologically hazardous areas, fish and wildlife habitat, and frequently flooded areas. Aquifer recharge areas, fish and wildlife habitat conservation areas, and frequently flooded areas are identified on the City of Kalama's critical areas maps along the natural gas pipeline alignment and are regulated by Chapter 15.02 KMC. A critical areas determination is required for all land use or development applications. If the determination reveals that there is a critical area or buffer on the site, then a critical areas permit would be required.

## **City of Kalama Shoreline Master Program**

The City of Kalama adopted Cowlitz County's Shoreline Master Program (SMP). All lands located within 200 feet of the ordinary high water mark of the Columbia or Kalama Rivers, the 100-year floodplain located within 200 feet of "streamways," and "marshes, bogs and swamps" (as defined in the SMP) are subjected to SMP regulations. A small portion of City land is located along the Columbia River. The natural gas pipeline would not lie within the shoreline area within the City of Kalama jurisdiction. Refer to "Cowlitz County Shoreline Master Program" below for more details.

Figure 4.2-1  
**City of Kalama Zoning**

## **State of Washington**

The siting of energy facilities such as the PMEC is regulated at the state level by EFSEC, under Chapter 80.50 RCW (Energy Facilities - Site Locations) and Title 463 WAC. Applicants for certification from EFSEC are required to submit detailed information on the proposed development and the impacts the development may have on the natural and built environments. The applicant is also required to describe the means to be utilized to minimize or mitigate possible adverse impacts on the physical or human environment (WAC 463-60-085). Further, the applicant is required to set forth insurance, bonding, or other arrangements proposed in order to mitigate for damage or loss to the environment (WAC 463-60-075). The PMEC facility would be under the jurisdiction of EFSEC.

Chapter 80.50 RCW operates to preempt all state and local matters relating to energy facility sites that are under the jurisdiction of EFSEC. Certification pursuant to Chapter 80.50 RCW is given in lieu of any permit, certificate, or similar document that might otherwise be required. Procedures to be followed by EFSEC in determining whether or not to recommend that the state pre-empt local land use plans or zoning ordinances for a site or portions of a site for an energy facility are set forth in WAC 463-28. The applicant is required to make every effort, including changes to the development design, to comply with all local land use plans, zoning ordinances, and shoreline management plans in effect at the date of the application filing. An applicant unable to resolve specific noncompliance issues may file a written request for state pre-emption as authorized in WAC 463-28-020.

### **4.2.1.3 Impacts to Existing Land Uses**

During construction at the development site, along proposed pipeline and transmission corridors, and railroad spur grading, earth movement and construction-related traffic would generate noise and dust which would impact nearby businesses and parks. Impacts and mitigation related to dust, noise, and traffic during construction are addressed in Sections 3.2, 4.1 and 4.3, respectively. The gas pipeline would be installed within an existing right-of-way and under Hendrickson Drive. Noise, dust and traffic impacts along the natural gas corridor would be temporary and occur only during construction. The construction of the railroad spur would affect wetlands; refer to Section 3.5 for more information.

Operation of the PMEC would be compatible with other industrial uses in existence or planned for the Port of Kalama. The entire Port is designated heavy industrial in the Cowlitz County Comprehensive Plan. Impacts to residential uses are not expected due to the facility's distance from residences, noise protection, landscape screening, and design. Operational dust, noise and traffic impacts and mitigation measures are discussed in Sections 3.2, 4.1 and 4.3 respectively.

### **4.2.1.4 Mitigation Measures**

To avoid or reduce impacts to adjacent land uses:

- Native vegetation would be retained as much as possible in the impact area.
- Landscape buffers would be installed on the perimeter of the site.

## **4.2.2 LIGHT AND GLARE**

### **4.2.2.1 Existing Environment**

The development site is located in an area designated as industrial in the Cowlitz County Comprehensive Plan. Ambient lighting levels at the site are moderate and primary light sources are from the neighboring industrial use (Steelscape), street lighting and headlights along the I-5 corridor and trains along the BNSF railway. Industrial sites south of the Kalama River would also contribute to ambient lighting levels. More distant residents and the commercial area in the City of Kalama are minor light sources because of their distance from the site and low density.

#### **4.2.2.2 Impacts**

Most construction would occur during daylight hours; however, minimal lighting would be used on the site at night for safety purposes. Impacts would be minimal and temporary.

The PMEC would be illuminated at night. Plant lighting would include low level lighting around exit areas (minimum 2 footcandles) and general outside area (0.2-5 footcandles) including ground level operating areas, stairs and platforms, roadways, fuel storage areas, and parking areas. This lighting would be provided for purposes of general operator access and safety under regular operating conditions. Precise and detailed placement of lighting fixtures has not yet been determined, but outdoor lights would be a combination of pole-mounted and structure mounted lights and likely would be standard street light height (20-40 feet). Outside lighting around the exterior of buildings and ancillary equipment likely would be placed above doorways. Generally, lighting angles would vary, determined by economic evaluation of fixture wattage, light patterns, and light levels. No high-mast, wide area lighting is planned.

Spot lighting would be provided for illumination level enhancement where needed around operating equipment. This lighting would be higher in intensity than general outside lighting (up to 10 foot candles), but would be limited to specific areas and occasional usage. This lighting can be adjusted to minimize light spillover or direct glare in response to specific site conditions. Emergency lighting would be provided for purpose of personnel egress and continuance of critical activities during failure of the normal power source or during emergency conditions. These instances are anticipated to be infrequent. Emergency lighting would be incandescent. Emergency lighting fixtures would be provided in the control room and other operations buildings. The gas turbine packages have self-contained direct current (DC) lights.

Light and glare impacts on neighboring properties are expected to be minimal. During the day, potential glare impacts will be minimal because of the planned use of non-reflective earth-tone/light paint colors on exterior surfaces. The potential for adjusting light directions and the use of supplemental light shields/vegetation to provide additional screening, if necessary, will minimize light spillover at night. There will be no anticipated glare impacts to vehicular drivers using I-5. As an industrial land use, the PMEC facility is expected to make a slight contribution to overall ambient light levels in the immediate vicinity. Residents across the Columbia River in Prescott, Oregon and neighboring Prescott Beach County Park are within 1 mile of the site and may be affected by lighting. Residents on Bluff Road on the hillside east of the site would also have a good view of the site and may be affected by lighting.

### **4.2.2.3 Mitigation Measures**

Most construction would occur during daylight hours. Lights that would remain on during the night time hours would be directed towards the site and would be the minimum wattage required for safety.

Development elements, except for the emission stacks, will be painted with earth tones. The emission stacks will be painted a light, warm-tone gray or similar color. These colors will reduce surface glare from direct sunlight and minimize visual impact. See Section 4.2.3.4 for a discussion of recommended mitigation measures for visual impacts.

## **4.2.3 AESTHETICS**

### **4.2.3.1 Methodology**

The visual resource methodology for inventory and impact assessment as a result of the PMEC includes the following:

- Inventory of existing visual quality;
- Identifying sensitive viewers and estimating their potential view of the proposed facility (general visibility and distance zone);
- Describing visual changes introduced by the construction and operation of the facility;
- Assessing visual impacts from sensitive viewpoints; and
- Recommending visual impact mitigation measures.

The methodology for preparing the visual simulations for the aesthetics portion of this Application consists of the following steps:

1. Viewpoints were identified from which the development would be visible. This was undertaken using professional judgment and nearby public viewpoints.
2. Photographs were then taken of the existing topographic and vegetative features. A record was made of all photos taken, including the photo viewpoint and focal length.

Field reconnaissance was conducted to determine the general visibility of the development facilities from the identified sensitive viewpoints (e.g., residences, travel routes, or other sensitive viewpoints). Visual impacts were assessed based on the visibility of changes from sensitive viewpoints as a result of construction and operation of the PMEC facilities. Levels of visual impact were documented as "high," "moderate," or "low."

Visual quality is described as the visual patterns created by the combination of rural character landscapes and industrial and man-made features. Visual quality was evaluated using the following descriptions:

- **Urban/Industrial** - Landscape is common to urban areas and urban/industrial fringes. Human elements are prevalent or landscape modifications exist, which do not compatibly blend with the natural surroundings (low visual intactness and unity).
- **Rural** - Landscape exhibits reasonably attractive natural and human-made features/patterns, although they are not visually distinctive or unusual within the region. The landscape integrity of the area provides some positive visual experiences such as natural open space with some existing agricultural areas (farm fields, etc.), or well-maintained and landscaped urban areas.
- **Unique/Distinctive** - Landscape exhibits distinctive and memorable visual features (landform, rock outcrops, etc.) and patterns (vegetation/open space) that are largely undisturbed--usually a rural or open space setting. Few if any man-made developments are present.

Viewer sensitivity is dependent on viewer types and exposure (number of viewers and view frequency), view orientation and duration, and viewer awareness/sensitivity to visual changes. Levels of viewer sensitivity were evaluated using the following criteria:

- **Low** - Viewer types representing low visual sensitivity include agricultural and industrial/warehouse workers. Compared with other viewer types, the number of viewers is generally considered small and the duration of view is short. Viewer activities typically limit awareness/sensitivity to the visual setting immediately outside the workplace. Views may be screened by landscaping or adjacent buildings.
- **Moderate** - Viewer types representing moderate visual sensitivity consist of highway and local travelers. The number of viewers vary depending on location, however, on average, they tend to be moderately large based on overall densities of surrounding areas and highway commuters. Viewer awareness and sensitivity are also considered moderate because destination travelers often have a focused orientation.
- **High** - Residential, recreational, and viewers congregating in public gathering places (churches, schools, etc.) are considered to have comparatively high visual sensitivity. The visual setting may in part contribute to specific building orientation or the enjoyment of the experience. Views may be of long duration and high frequency. In some cases, views may contribute to property value.

#### 4.2.3.2 Inventory

The PMEC is located on the east bank of the Columbia River in western Cowlitz County in southern Washington State. Figure 2.3-2 shows a computer generated rendition of the proposed facility. Industrial activity and transportation corridors are the primary determinants of human-made visual character in the immediate development area. The valley walls rise on both sides of the Columbia up to approximately 1,000 feet.

#### Landscape Setting

The PMEC would be located at the northern end of the Port of Kalama with both the Burlington Northern Santa Fe (BNSF) and United Pacific (UP) Railways and Interstate 5 (I-5) immediately

to the east. Due to a large rock formation and forested area, little of the site can be seen from I-5. To the south of the site is Steelscape Inc., a steel coil processing industrial facility, to the north is a wetland and greenspace, and to the west is the Columbia River.

## **Visual Quality**

The PMEC would be located in an industrial area characterized by heavy industrial development. Steelscape Inc., which produces cold-rolled, metallic-coated and painted steel coils, lies directly south of the proposed development site (see Figure 2.1-2). This facility consists of one main large building and a railroad spur. Across the Columbia River to the west is the Trojan Nuclear facility that was decommissioned in April 2005. The 499-foot parabolic cooling tower was recently imploded in May 2006. The cooling tower was the dominant vertical element in the area and could be seen for miles along the Columbia River. The cooling tower is gone, however, the waste storage and associated facilities remain including the reactor building which dominates the view and is easily seen from I-5. On the river side and surrounding hills, the Longview Fibre paper mill is clearly visible.

Overall, visual quality of the landscape setting is classified as "rural" character. The landscape contains reasonably attractive natural features and patterns are reasonably attractive and interesting, although they are not visually distinctive or unusual within the region. However, the industrial features are dominant and do not blend well with the natural setting. Visual integrity is low, because it is moderately altered.

Visual unity is generally low. Landscape alterations such as industrial buildings are large and not particularly well-integrated with undisturbed conditions. Travelers along Tradewinds Road for example, view industrial warehouses and equipment, railroad corridors, commercial signs and structures, utility lines, and roadside vegetation. Additionally, limited vegetation screening exists around the industrial development.

The PMEC site is vacant industrial land covered primarily with low grasses. The northern boundary of the site is bordered by deciduous trees, a wetland, and a backwater channel of the Columbia River. No large shrubs, trees, or previously existing buildings are centrally located on the site. The visual quality of the site is classified as "urban/industrial." The site is topographically featureless and non-distinctive. Visual unity with the surrounding area is moderate.

## **Pipeline Route**

The proposed natural gas pipeline would be approximately 5 miles in length and would extend from the plant site south to the Deer Island Natural Gas Pressurization Station near Exit 27 on the west side of I-5 (see Figure 2.1-1). The gas pipeline would be located within existing pipeline right-of-way and would be directionally drilled under the Kalama River or hung on the Hendrickson Drive bridge over the Kalama, then follow the dike/walking path along the Kalama River until it meets up with Hendrickson Drive. The pipeline would travel within Port land and under or along side Hendrickson Drive; the adjacent land use is predominantly industrial, with a section of park including a marina.

## Railroad Spur

One or more rail sidings or spurs will be needed to connect the P MEC rail loop to the Burlington Northern Santa Fe and Union Pacific joint rail line. These spurs would be constructed within the present rail right-of-way. The loop track will consist of about 11,300 lineal feet for the loop and siding track (turnout on mainline, around the site, to loop closure) and about 4,500 feet of sidings for non-feed stock shipping and receiving, resulting in a total of about 15,800 lineal feet of new railroad track. The loop track would ring the plant site. A wetland immediately to the east of the site would be filled to accommodate the tracks. See Section 3.5 for a description of the wetland.

The remainder of the area has no large shrubs, trees or buildings. The visual quality of the site is classified as "urban/industrial." The site is topographically featureless and non-distinctive. Visual unity with the surrounding area is moderate. The tracks themselves would not be visible from off-site. The trains would be visible from most viewpoints; however, they would be small relative to the P MEC itself and existing mainline train activity.

## Viewer Types and Sensitivity

Primary viewer types in the P MEC vicinity include industrial workers, residents, local or business travelers. Figure 4.2-2 identifies five viewpoints of the development site.

**Bluff Road and Topeka Lane Residents.** This low-density residential area is approximately 2,250-feet to the north-east on a hillside overlooking the site. From homes in this area some of the viewpoints look southwest toward the P MEC site. Intervening trees will screen some of the P MEC elements, and some screening could be provided by trees planted along the P MEC boundaries if there is adequate room along the rail line, however, some of the features will protrude above the treeline and facilities will be a dominant feature of the view. At the time of the field survey, these viewers had a view of Steelscape and the Trojan Nuclear facility. (The Trojan Nuclear facility parabolic cooling tower was imploded in May 2006). Overall visual sensitivity for elevated residential viewers is "moderate" due to the close viewing distance and elevated viewpoint. See Figure 4.2-3, Viewpoint 1.

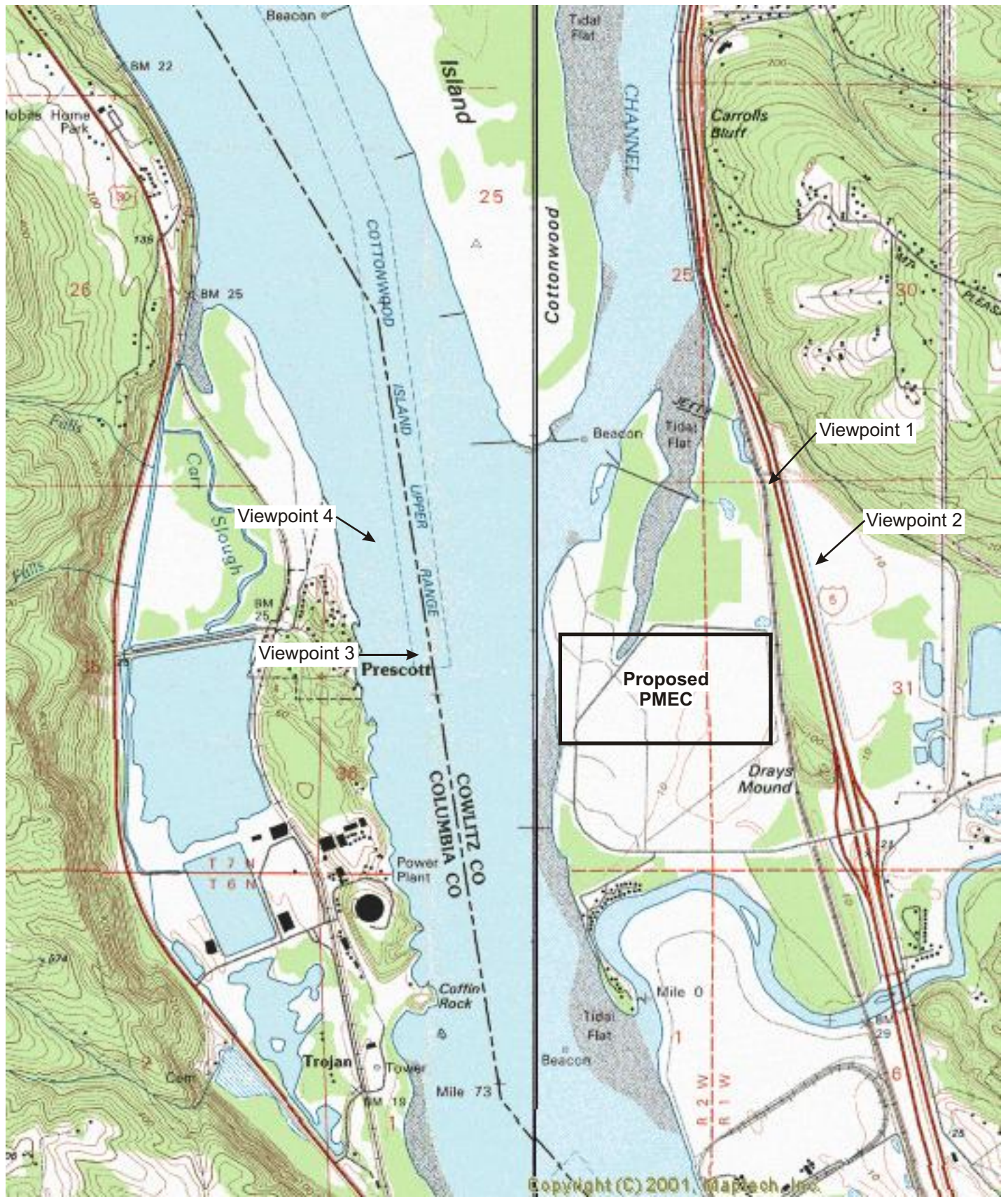


Figure 4.2-2

## Views of the Pacific Mountain Energy Center

Job No. 33758342



Figure 4.2-3 Existing View From Viewpoint 1 - Bluff Road.

**Residents along Old US 99.** There are a few residences along Old US 99 which face south-west towards the site. These houses are approximately 2,250-feet to the north-east and at a slight elevation. Currently, their view is mostly blocked by existing deciduous and some evergreen trees along the I-5 corridor, especially in the summer. However, taller features such as the steam generators and flare enclosures would be visible above the trees. Visual sensitivity of residents along this road would be rated “moderate”. See Figure 4.2-4, Viewpoint 2.



Figure 4.2-4 April 19, 2006 View From Viewpoint 2 – Old Highway 99 (prior to demolition of Trojan cooling tower).

**I-5 Corridor.** Interstate-5 is the primary north-south route through Washington and Oregon. Travelers would have a limited view of the proposed site, as the highway is not oriented towards the site, so views would be sideward glances. North-bound travelers would be oriented slightly towards the proposed facility and south-bound slightly away. Viewers would see industrial facilities and an elevated railroad. This view is blocked in many areas by deciduous trees, but taller features would be visible above the treeline. At the closest point, I-5 passes within approximately 600 feet of the rail road spur which runs around the outside of the site. Based upon the viewer type, highway orientation, and viewing range, visual sensitivity for travelers along I-5 is estimated to be "low".

**Riverfront Residents of Prescott, Oregon.** Prescott is approximately 3000 feet north-west of the site on the opposite bank of the Columbia River. Prescott is a small community of less than 100 people located just north of the decommissioned Trojan nuclear facility adjacent to the P&W railroad and Hwy 30. Residents along Riverview Road, Ivy Lane, and the eastern end of School Street who have houses with a view of the Columbia River would also have a view of the PMEC site as well as heavy paper mill industry to the north in Longview and Port industry to the south. Visual sensitivity would be rated as "high". Residents currently have a view of the industrial park and affiliated docks to the south of the proposed site. At the current site, there is no vegetation that would provide screening to residents. See Figure 4.2-5, Viewpoint 3.



Figure 4.2-5 Existing View From Viewpoint 3 – Prescott, Oregon.

**Visitors to Prescott Beach County Park.** Prescott Beach County Park is a 71-acre day use park with one mile of beach access on the west side of the Columbia River approximately 4000 feet north-west of the PMEC site. This day-use park was developed in conjunction with Trojan Nuclear plant and is open year round and provides access to the Columbia River to fish as well as a covered picnic shelter, playground equipment, a horse shoe pit, and sand volleyball courts. Visual sensitivity would be “moderate”. The view from Prescott Beach County Park would be very similar to that of residents with riverfront property in the town of Prescott to the south. See Figure 4.2-6, Viewpoint 4.



Figure 4.2-6 Existing View From Viewpoint 4 – Prescott Beach County Park.

**Columbia River.** Travelers on the Columbia River are recreational boaters, and fishers as those working on shipping vessels. Viewers in small vessels could get quite close to the site; whereas viewers from large ships would tend to travel along the center line. Visual sensitivity would be “low” for viewers working on vessels as they would be focused on work activities. However, visual sensitivity for recreational users would be “high” because they would have a high concern for scenery and would be able to travel close to the site.

**Tradewinds Road.** The highest concentration of nearby industrial workers would be at Steelscape, Inc. The distance between this facility and the railroad spur which runs around the outer edge of the proposed PMEC site is approximately 100 feet. Topography in the area is flat and there is currently a road between the two sites. Visual sensitivity is expected to be “low” because observers in the area will be focused on work activities and will thus have a limited awareness of peripheral visual conditions. For the same reasons, the visual sensitivity of other industrial workers in the area is expected to be “low”. See Figure 4.2-7, Viewpoint 5.



Figure 4.2-7 April 19, 2006 View From Viewpoint 5 – Tradewinds Road (prior to demolition of Trojan cooling tower)

#### **4.2.3.3 Impact Assessment/Mitigation Planning**

##### **Visual Contrast**

During construction of the PMEC, grass and other vegetation will be removed as part of grading operations. Viewers would observe site grading and facility construction. When completed the viewer would see gasifiers, water pretreatment/office complex, fuel storage, conveyors, rail loop, cooling tower, air separation unit, feed stock preparation area, waste treatment facility, switchyard, gas cleaning area, inert slag storage, gas turbines, heat recovery steam generators, steam turbines, and a dock. Figure 2.3-2 presents a computer simulation of the proposed complex showing the major components of the complex. Heights of development components are presented on Table 4.2-1. PMEC components will be painted predominately earth tones. A short plume of water vapor would be visible from the cooling towers on most days. Emissions would be more visible on cooler and moister days when the air is already saturated. There is also the potential to see water vapor emissions from the exhaust stacks. Refer to Section 3.2.3 and Appendix B-2 for more details.

**TABLE 4.2-1  
ESTIMATED HEIGHTS OF PMEC COMPONENTS**

<b>Structure</b>	<b>Height (feet)</b>
Combustion Turbine Generators	20
Steam Turbine Generators	40
Air Separation Unit Building	30
Heat Recovery Steam Generators	80
Feed Stock Feed Bins	80
Cooling Towers	40
Gasification Block	200
Exhaust stacks	120
Feedstock Storage Buildings	80
Flare Enclosure	80

The property to the north of the site has many trees which will provide screening from the north. Vegetation along the I-5 corridor will also provide screening from the east. Close viewers will also observe a chain-link fence that will surround the site.

Temporary visual changes introduced by construction of the proposed natural gas pipeline and railroad spur would include vegetation clearing, filling of a wetland, trenching, and placement of pipe sections and rail road tracks by heavy equipment. Low-growing vegetation would be removed during trenching operations. A wetland located between the eastern edge of the proposed site and the BNSF railroad would be filled. Much of the pipeline would travel along an existing road and road right-of-way. To cross the Kalama River, the pipeline will either be directionally drilled under the river or hung along the Hendrickson Drive bridge and follow a dike/walking path to Hendrickson Drive. After construction is completed, the disturbed corridor will be returned to its original state, either road surfacing or reseeded with grasses and low vegetation.

### **Visual Impacts**

In general, visual impacts to the overall landscape setting resulting from construction of the PMEC are expected to be low. The size of the site is relatively similar compared to existing and on-going land disturbances created by other industrial development. During construction, viewers will observe earthwork equipment, construction trailers, building construction, and cranes. No interim screening will be provided, but construction duration will be short and exposed soil will be reseeded within several months of construction completion.

Once constructed, the PMEC is expected to introduce "low" to "high" visual impacts, depending on the viewer type and viewing distance. When the landscaping fully matures (beginning in approximately 10 years), the visual impact will be reduced to "moderate". The facility would be visually compatible with the industrial development already existing in the area. The form, color, and scale of buildings will be similar to nearby industrial/warehouse development. Visual impacts from each representative viewpoint are summarized in Table 4.2-2.

**TABLE 4.2-2**  
**SUMMARY OF VISUAL IMPACTS FROM REPRESENTATIVE VIEWPOINTS**

<b>Location Description</b>	<b>Visual Quality</b>	<b>Visual Sensitivity</b>	<b>Visual Impact</b>
Residences along Bluff Road and Topeka Lane	Urban/industrial	M	M
Residences along Old US 99	Urban/industrial	M	M
I-5 Corridor	Rural	L	L
Riverfront Residents in Prescott, Oregon	Rural	H	H
Visitors to Prescott Beach County Park	Rural	M	M
Columbia River	Rural	H and L	M
Tradewinds Road	Urban/industrial	L	L

#### Visual Sensitivity

H = High

M = Moderate

L = Low

#### Visual Impact

L = Low

M = Moderate

H = High

### **Pipeline Route**

Along the proposed natural gas pipeline route, there would be temporary short-term impacts limited to the construction phase. Visual impacts are estimated to be "moderate" and short term. Local travelers will observe pipeline construction at many locations, but the duration of impacts will be short and disturbances in or adjacent to road right-of-ways are typical. The disturbances would also occur primarily in an industrial area and viewers are accustomed to construction activities.

#### **4.2.3.4 Mitigation Measures**

To avoid impacts to the nearest residences, located northwest of the site:

- Existing trees will be used as landscape buffers and will remain on the perimeter of the site to reduce the visual presence of the PMEC itself and increase its visual compatibility with the context of the surroundings.
- If needed to mitigate the view of the plant site from residences, Energy Northwest would plant native specimen trees to screen the view of the plant site to the extent possible, as well as to plant fast-growing trees, such as poplars, to expedite the development of a mature vegetative screen.
- Landscaping will be provided in parking lots and along access roads.
- The facility will be painted with earth-tone colors.
- The emission stacks will be painted with earth tones.

In addition, the following measures may be included if needed:

- Provide additional screening by including low tree/shrub plantings
- Construct screening walls around ancillary elements. Wall treatments could include aesthetic material and texture patterns.

#### 4.2.4 RECREATION

##### 4.2.4.1 Inventory of Facilities

The primary recreation activities within Cowlitz County are fishing, boating, and hiking due to the proximity of the Columbia River, the numerous streams and Mount St. Helens. Land based recreation opportunities in the immediate vicinity are limited due to the proposed location of the PMEC between I-5 and BNSF, and the Columbia River. The Columbia River, however, is a popular location for water based activities, such as boating and fishing. The Amtrak Cascades train travels by the site daily.

The closest public recreation facility to the proposed PMEC site is a Washington State Fish and Wildlife (WDFW) boat launch located on the south bank of the Kalama River at the junction of Modrow and Kalama River roads approximately ¼ mile south of the site. On the north bank of the Kalama River, at it's confluence with the Columbia River is also a private dock and recreation area owned by the Kalama Sportsman's association. The proposed natural gas pipeline alignment would be located along Louis Rasmussen RV Park, the Port of Kalama Marine Park, and the Port of Kalama Marina. The pipeline would also cross the 1 mile graveled pedestrian and bicycle pathway through the Kalama industrial areas. Recreation facilities nearby the site and the natural gas pipeline alignment are listed in Table 4.2-3 and shown on Figure 4.2-8.

**TABLE 4.2-3  
PUBLIC PARK AND RECREATION FACILITIES NEARBY THE PMEC AND  
NATURAL GAS PIPELINE ALIGNMENT**

	<b>Name</b>	<b>Facilities</b>	<b>Owner</b>
1	Louis Rasmussen RV Park	<ul style="list-style-type: none"> <li>• 22 spaces with full hook-up</li> <li>• showers</li> <li>• pedestrian/bicycle pathway (approximately 2 miles) along the Columbia River</li> </ul>	Port of Kalama
2	Port of Kalama Marine Park	<ul style="list-style-type: none"> <li>• five acre day-use park</li> <li>• public beaches</li> <li>• covered picnic shelters, playgrounds, restrooms</li> <li>• baseball field</li> <li>• Totem Poles, Lewis &amp; Clark Monument</li> <li>• bordered by a pedestrian/bicycle pathway along the Columbia River</li> </ul>	Port of Kalama

**TABLE 4.2-3 (Continued)**  
**PUBLIC PARK AND RECREATION FACILITIES NEARBY THE PMEC AND**  
**NATURAL GAS PIPELINE ALIGNMENT**

	Name	Facilities	Owner
3	Port of Kalama Marina	<ul style="list-style-type: none"> <li>• public boat launch</li> <li>• 222-slip marina, marine fuel, long/short term moorage</li> <li>• showers, 1.8 miles paved and boardwalk</li> <li>• a large sand beach at Ahle Point (fishing, swimming, and windsurfing)</li> </ul>	Port of Kalama
4	WDFW boat launch	<ul style="list-style-type: none"> <li>• ¼ acre Kalama River access site</li> <li>• drift boat launch</li> <li>• portable restrooms</li> </ul>	WDFW
5	Prescott Beach County Park	<ul style="list-style-type: none"> <li>• 70 acre day-use park</li> <li>• 1-mile of river access</li> <li>• covered picnic shelter, playground equipment, horse shoe pit</li> <li>• sand volleyball courts</li> </ul>	Columbia County Oregon
6	Kalama Sportsman Association Park	<ul style="list-style-type: none"> <li>• RV spaces</li> <li>• boat launch</li> </ul>	Kalama Sportsman Association

No county recreation facilities are within 5 miles of the proposed IGCC facility. The closest county facility would be Finn Hall Wayside Park located near Woodland on SR-503, 13 miles south. It is a 4-acre wayside with picnic area and open space managed as a cultural and historic area.

There are no wild and scenic rivers or national trails located within 5 miles of the proposed facility. The Gifford Pinchot National Forest, which includes Mount St. Helens National Volcanic Monument, is located approximately 40 miles east of the site. The monument includes the Johnston Ridge Observatory and numerous information centers. Since the explosion of Mount St. Helens in 1980 and more recent volcanic activity, the monument has become a popular tourist destination. Cowlitz County and its Chamber of Commerce promote their community as the “Gateway to Mount St. Helens”. Recreation activities in the national forest include hiking, backpacking, horseback riding, mountain biking, motorized trailbiking and camping opportunities.

Prescott Beach County Park is located directly across the Columbia River in Columbia County, Oregon. This day-use park is open year-round and provides access to fishing and windsurfing as well as a covered picnic shelter, playground equipment, a horse shoe pit, and sand volleyball courts.

#### **4.2.4.2 Established Plans and Policies**

The City of Kalama completed a Parks and Recreation Plan in 2002 that serves as the Parks, Recreation and Open Space element of their 2005 Comprehensive Plan. This plan outlines goals, policies, objectives and important background information in order to guide recreational development in the Kalama area. There are no County Parks nearby the proposed facility or natural gas pipeline.

There are no new parks or recreation facilities planned within a five mile radius of the site or the natural gas pipeline corridor.

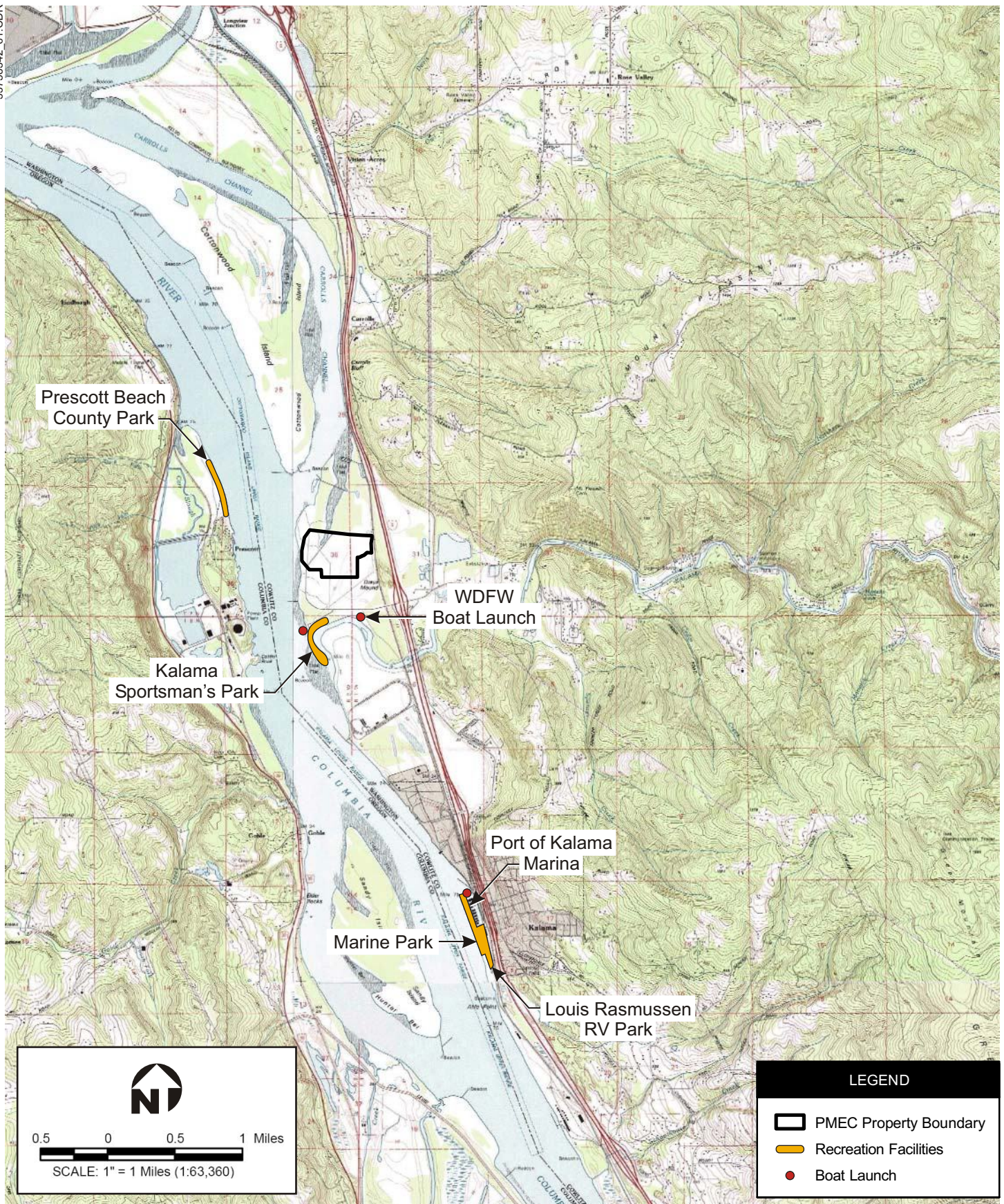


Figure 4.2-8  
**Recreation Facilities**

There are no existing Cowlitz County or City of Kalama ordinances or regulations that would require a dedication of land for recreation facilities, or money in lieu thereof, as a result of the proposed development. Although ordinances of this type could be adopted in the future, it is unlikely that Cowlitz County or the City of Kalama would assess such requirements against the development.

No federal recreation regulations apply to the site or the gas pipeline route, nor are there federal or state plans for recreation facilities in the site.

#### **4.2.4.3 Impacts**

The majority of the PMEC construction workers are expected to be within a daily commuting distance of the site. At peak construction periods, some workers may seek temporary housing in apartments or motels, or may make private arrangements for recreational vehicles. Existing limits on the length of stay in public camping areas would minimize any potential impacts on park users. Minimal impacts to park or recreation facilities are expected from construction workers.

The access road to the WDFW boat launch and Kalama Sportsman's Club Park is Kalama River Road, which would also be used to access the site. Access may be temporarily affected during construction.

The natural gas pipeline would run along the eastern edge of the Port of Kalama Marine Park, Rasmussen Louis RV Park, and Port of Kalama Marina. This would result in earth movement and construction-related traffic that will generate noise and dust which may temporarily disturb activities at and access to these parks.

The construction of the railroad spur would also generate noise, dust and traffic which may impact access to the WDFW boat launch and the Kalama Sportsman's Club Park. There would be no impacts on recreation related to use of the railroad spur during the operation phase of the project.

#### **4.2.4.4 Mitigation Measures**

Impacts to recreation users would be limited to the construction phase and would primarily result from dust and noise from construction equipment. See Section 2.11 Emission Control and 4.1 Environmental Health for mitigation measures proposed for air quality and noise during construction.

### **4.2.5 HISTORIC AND CULTURAL PRESERVATION**

#### **4.2.5.1 Introduction**

The need to undergo a state permitting process requires a determination of effects to historic properties, per Section 106 of the National Historic Preservation Act of 1966, as amended. A cultural resources survey has been conducted at the proposed locations for the PMEC, railroad spurs, and natural gas pipeline (development) in order to assess the potential for such impacts.

This survey was designed to identify, evaluate, and record prehistoric and historic cultural resources per 36CFR800. The survey objectives include identification of archaeological resources and historic properties located within the development Area of Potential Effects (APE) that might be considered eligible for nomination to the National Register of Historic Places (NRHP).

#### **4.2.5.2 Regional Context**

The development area is located within the east side of the Columbia River floodplain, with elevations across the site ranging from 18 to 24 feet above mean sea level. The distance between the contemporary channel of the Columbia River and the development area varies between approximately 100 feet to nearly 0.5 mile. The development area is found within the southern extent of the Puget Trough physiological province characterized by the *Tsuga heterophylla* vegetation zone, of importance for timber production (Franklin and Dyrness 1988:70).

The APE is identified on the USGS 7.5 minute series Kalama and Deer Island Washington-Oregon quadrangles (Figure 4.2-9 and 4.2-10). The APE includes a cumulative total of approximately 110 acres for the plant site and pipeline; each development component is addressed separately.

#### **PMEC Site**

The APE for the proposed PEMEC site is found in Township 7 North, Range 2 West, Section 36 and Township 7 North, Range 1 West, Section 31 and includes an approximate 95-acre parcel of land. The development component is generally located along the Columbia River, north of Kalama city limits, west of I-5, within land owned by the Port of Kalama, and is a green field site located adjacent to an industrial plant. Boundaries include Tradewinds Road to the east, Eastwind Road to the west and north, and an existing industrial plant to the south. Included within the APE for the plant site area is the railroad spur component, which would extend for approximately 2,000 feet from the existing BNSF and UP railway mainlines.

#### **Pipeline**

The APE for the proposed pipeline is found in Township 7 North, Range 2 West, Section 36; Township 7 North, Range 1 West, Section 31; Township 6 North, Range 2 West, Sections 1, 6, 7, 17, 18, 20, and 44. The pipeline would extend for approximately 5 miles from the plant site near Exit 32 south to Exit 27 on the west side of I-5. The pipeline portion of the development includes an APE measuring 30 m (100 feet) in width and occupies a cumulative total of approximately 50 acres. The pipeline is anticipated to be constructed within or adjacent to previously developed roadways, railroad tracks, and levees for much of its route.

The pipeline would continue south along Fisherman's Loop Road, crossing a cement automobile bridge along Hendrickson Drive and following an adjacent levee south of the Kalama River; from this point south, the pipeline would generally follow Hendrickson Drive to its terminus at the Williams Northwest Pipeline at or near the Deer Island meter station.

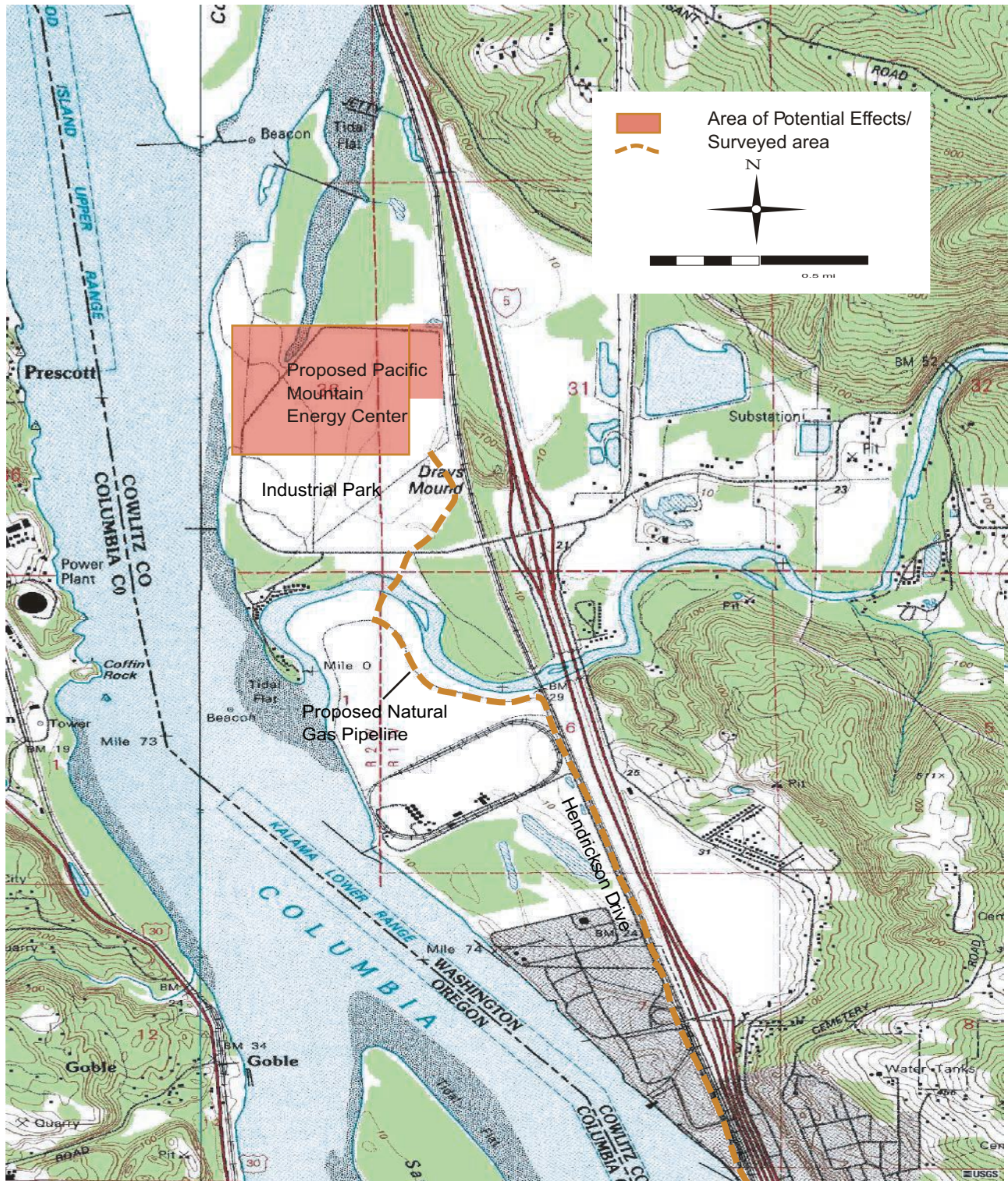


Figure 4.2-9

## Portion of USGS 7.5' Series Cathlamet Quadrangle

Job No. 33758342

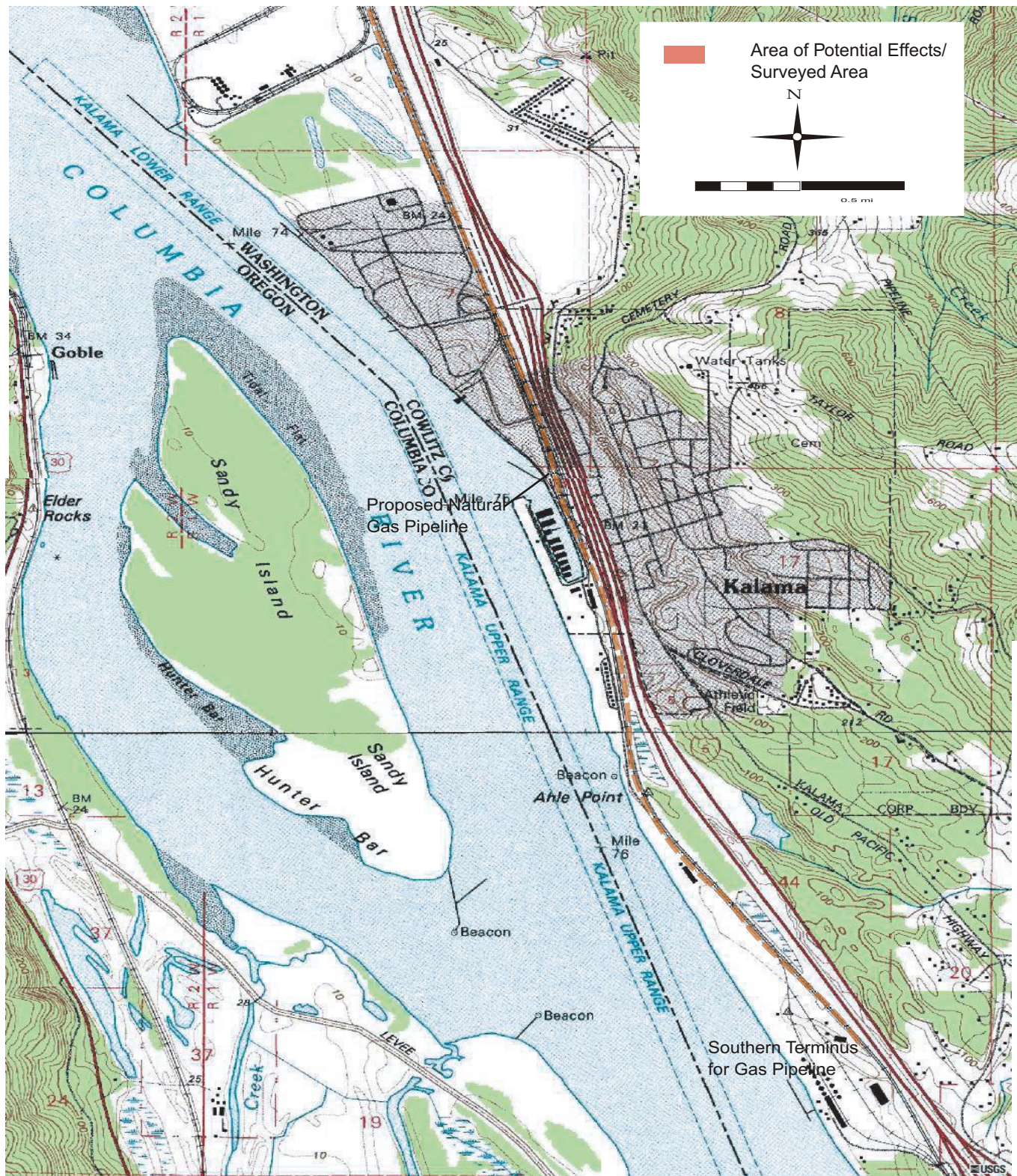


Figure 4.2-10  
**Portion of USGS 7.5' Series  
 Cathlamet and Deer Island Quadrangles**

## Kalama River Crossing

The pipeline would cross the Kalama River south of Sportsmens Club Road on the north side of the river, in the vicinity of a cement bridge that was constructed by the Port around 2000, to the south side of the Kalama River. The pipeline would either be drilled beneath the river or hung on the under side of the existing bridge. The pipeline route would then follow an existing dike along the south side of the river to its intersection with Hendrickson Drive near I-5.

### 4.2.5.3 Cultural Background

Prehistory of the Lower Columbia region has been summarized by Pettigrew (1990). The Kalama area falls within the cultural sequence defined for the Portland Basin (Pettigrew 1981). The Portland Basin sequence includes two phases spanning from about 600 B.C. to the historic period. The Merrybell phase (600 B.C. to ca. 300 A.D.) is characterized by the predominance of large, broad-necked stemmed points. Smaller, narrow-necked notched points emerge in the Multnomah phase (ca. 300 to 1750 A.D.). The earliest known sites in this region are located above the Columbia River floodplain because rising water levels have inundated sites located on the floodplain prior to about 3000 B.C. Sites that have been identified near the Columbia River, or peripheral sites, have been identified in forested or formerly forested surfaces not subject to flooding. Few peripheral sites have been studied intensively. Characteristic artifacts include unifacially flaked cobbles and projectile points, as well as cobble celts, loaf stones, stone weights, and foliate bifaces. Large riverside settlements and rectangular house structures are present by the Merrybell phase. Cultural lifeways appear unchanged for the past 3000 years based on the cultural chronology (Pettigrew 1990).

Kalama falls within the territory traditionally occupied by the Cathlamet, an Upper Chinookan-speaking people who resided along the Columbia River, east of the Lower Chinook and west of the Multnomah groups. The Cathlamet lived along the Columbia River between Grays Bay and Kalama. Two ethnographic villages are reported at the mouth of the Kalama, including *Tlakalama*, and *Cath la haws* (Silverstein 199:533-534, Figure 4.2-9). Cathlamet subsistence was based primarily on salmon, supplemented with seasonal plant and animal resources including berries, camas, wapato, deer, elk, bear, and waterfowl. Houses were constructed from cedar planks; longhouses were located along the Columbia River and tributaries. The deceased were often placed in canoes elevated on trees or posts; one important burial place was Coffin Rock near the mouth of the Cowlitz River. The Kalama River was a reported gathering place for the harvesting of smelt among the Nisqually, Cowlitz, and Klickitat (Forsman et al. 2000:16 citing Bureau of Indian Affairs 1995:63).

The Cathlamet were signatories to a treaty that ceded their lands in 1851. Lewis and Clark estimated the Cathlamet population to be about 300 in 1805-1806; by 1849 there were only 58 remaining according to territorial estimates. The Cathlamet are no longer considered a tribal entity (Ruby and Brown 1992:12).

The first non-native group to record travels to the area was a 1792 British expedition led by Lieutenant Broughton under the command of George Vancouver, which explored from the mouth of the Columbia River to the Washougal and Sandy rivers. Following Vancouver's

expedition, no direct contact was recorded until the overland Lewis and Clark expedition camped opposite the Kalama River, noting an abandoned village at the mouth of the river (Urrutia 1998:22).

The origin of the name Kalama has various possibilities. One is that it was a native word; a second is that it was named for native Hawaiian John Kalama, who worked for the Hudson's Bay Company and married a Nisqually woman in the 1830s, becoming a respected resident of the Kalama region; a third is based on the journal of Gabriel Franchere, Pacific Fur Company explorer, who in 1811 recorded the village at the mouth of the Kalama as *Thlakalamah* (Urrutia 1998:94). Silverstein (1990:545) attributes the word to *galakalama*, "those of the rock", with variants *Tlakalama* and *Klakalama*.

Within five years of the Lewis and Clark expedition, fur-traders began exploring the area. David Thompson of the North West Company traveled from the source of the Columbia to the mouth in 1811 and noted a long row of Indian houses at the mouth of the Kalama River (Urrutia 1998:26). The Hudson's Bay Company established a trading post near the Cowlitz River, the Caweeman Post, and later the Puget Sound Agricultural Company, with a farm in the Cowlitz Valley, by 1839 (Urrutia 1998:28). Many other traders, missionaries, and explorers traveled through the Kalama area throughout the early nineteenth century, however, extensive permanent settlement by Euroamericans did not occur until the 1840s as Oregon Trail emigrants began to arrive.

The first American settlers were the Jonathan Burbee family, who settled briefly near the mouth of the Kalama in 1847. The first to file a claim in Kalama was the Ezra Meeker family, who arrived in 1853, but whose stay was also shortlived (Urrutia 1998:40-50). Nearly two decades would pass before the town of Kalama was established. In 1870, the Northern Pacific Railroad began constructing the town with the intent of building the western terminus of a transcontinental rail line. The railroad erected a number of buildings, and within a few months the population exploded to over 3500 people. Kalama was anticipated to rival Portland because of its proximity to the Pacific Ocean. The track was completed to Tacoma by 1873; shortly thereafter, Northern Pacific moved its headquarters to Tacoma and the economy of Kalama suffered. The Kalama ferry was constructed in 1883 and freight cars could be transported to Portland via crossing the Columbia River to the Oregon Railway and Navigation Company railroad. Ferry transportation became obsolete when the rail was continued from Kalama to Vancouver and the railroad bridge from Vancouver to Portland was constructed in 1908 (Urrutia 1998:98).

Logging and lumber production emerged as the primary industries after the railroad was completed. Kalama became the Cowlitz County seat in 1872, and remained so until Kelso won the vote in 1922. The Port of Kalama was established in 1920, and primarily leased land for sawmill operations (Urrutia 1998:158). During World War II, Kalama and nearby towns aided the war effort by salvaging ships. The town was flooded in 1948, when water from the Columbia washed over the railroad tracks and into downtown (Urrutia 1998:192). After World War II, the construction of Highway 99 through Kalama allowed for better access. Kalama has emerged as a bedroom community for Vancouver and Portland commuters, and continues to be a stopping point for travelers along the I-5 corridor.

#### 4.2.5.4 Cultural Resource Assessment

##### Pre-Field Research

To initiate the current study, a record search was conducted at the Washington State Department of Archaeology and Historic Preservation (DAHP) on March 13, 2006. Data from previous surveys and previously recorded archaeological sites in the vicinity were reviewed. The National Register of Historic Places (NRHP) and Washington Heritage Register were consulted for a list of eligible or listed properties in the vicinity. Regional ethnographic, historic, and archaeological references were consulted. The locations of previously identified archaeological sites are considered to be confidential information and are not provided on the attached figures.

One previously recorded archaeological site, 45CW5, falls near the proposed development area along the pipeline's west alternate Kalama River crossing. The location of this village site was described as "along the south bank of the Kalama River, about 200 yards from the mouth of the river" and was presumed to correspond with *Lakialama* noted by Curtis or *Cath-la-haws* as noted by Lewis and Clark (Smith and Hudziak 1948). Very little additional information is present on the site form other than the observation that considerable silt has been deposited by the river. The US Army Corps of Engineers later surveyed the area in an attempt to relocate the site, but found no archaeological materials (Martin 1985).

Within 0.5 mile of the development area, three additional sites have been previously recorded. Site 45CW4 is a village site located along the shore of the Columbia River at the mouth of the Kalama River (Smith and Hudziak 1948a) that may now be inundated by the river. Site 45CW127 is a camp, recorded by Munsell likely in the 1960s or 1970s, located on the north side of the Kalama River and east of I-5; this site is located approximately 1800 feet (549 meters) from the development's east alternate for the Kalama River crossing and would have extended over 0.25 mile north to south and 200 feet east to west along the river. Site 45CW11 is located 0.75 mile east of the proposed development area along the Kalama River and is a reported Chinook village site. Materials reported by the landowner included over 60 points, as well as scrapers, knives, stone beads, and bowls (Warren and Eng 1955).

In addition to these sites, a USGS quadrangle dated 1953 on file at DAHP depicts site 45CW152 north of the Kalama River and immediately east of the railroad tracks, which would fall within or very near the current development area. However, the site form for this assigned trinomial does not correspond to the plotted locale and is located well outside of the development area. It would appear that site 45CW152 is misplotted on the 1953 USGS quadrangle based on the site form; consequently, this site would not fall within the current development area. The more recent DAHP Geographic Information System database does not show the site within the development area, and is presumed to be the more accurate source. No archaeological materials were noted in this area during the field survey, supporting this conclusion.

One previously inventoried historic architectural resource falls within the development area. The Burlington Northern Railroad Kalama River Bridge was constructed in 1911 but has been recommended as not eligible for nomination to the National Register of Historic Places (Brush 2003).

Based on the record search, it appears that no previous cultural resource surveys have been conducted within the development area, and that few recent, systematic surveys or excavations have occurred in the Kalama area. Most recent surveys in the vicinity have been small in scale and include a survey and limited subsurface testing conducted for a proposed water filtration plant (Musil 2000), for a regeneration site related to an existing fiber optic cable (Forsman et al. 2000), and for a fiber optic cable (Chapman et al. 1996). No cultural resources were identified as a result of these investigations.

General Land Office (GLO) maps were reviewed for the development area. A GLO dated 1863 shows claims by Joseph Dray and Francis Ward along the Columbia River in the PMEC site vicinity, though no historic features such as buildings are depicted in this area. The “Trail from Monticello [modern-day Longview; see Urrutia 1998:48] to Fort Vancouver” is noted to the east of the proposed PMEC site in Township 7 North, Range 1 West, Section 31. An 1857 map for Township 6 North, Range 1 West, depicts the Davenport residence and farm fields in Sections 17 and 18; the Weldon residence is depicted in Section 20 along the river, and the aforementioned wagon road parallels the river from north to south.

## **Native American Consultation**

To initiate Tribal consultation, correspondence has been sent to cultural resource representatives of the Cowlitz Indian Tribe and Chinook Nation by URS on behalf of Energy Northwest requesting information on archaeological sites, traditional cultural properties, or any other concerns that the Tribe might have with this development. Copies of these letters are attached in Appendix G. Ed Arthur, Assistant Tribal Historic Preservation Officer of the Cowlitz Indian Tribe, was contacted via telephone on May 9, 2006. Mr. Arthur expressed interest in the development, iterated sensitivity of the development area to the Cowlitz, and requested to be the primary contact for future correspondence regarding the development; consultation is ongoing.

## **Field Methods**

A pedestrian survey was conducted in March 2006. During the course of the inventory, portions of the development corridor were subject to intensive pedestrian survey utilizing transects spaced at average intervals of 30 meters or less. However, the majority of the pipeline corridor consisted of asphalt roadway on raised, filled levees. Areas excluded from pedestrian survey include: (1) 1500-foot-long segment of the proposed pipeline at the northern terminus of the development from the PMEC site south to West Kalama River Road, since this area lies within a fenced, active industrial park, and (2) the proposed pipeline corridor extending from the southern terminus north along Hendrickson Drive; this portion of the corridor consists of an asphalted roadway on a raised levee and was subjected to a windshield reconnaissance only. Occasional cut bank exposures were inspected where the road runs nearest the Columbia River in the vicinity of the existing wastewater treatment plant. No subsurface probing was conducted as part of this inventory.

#### **4.2.5.5 Field Survey Results**

##### **PMEC Site**

The development area for the PMEC consists of a fenced enclosure located on a bench above the Columbia River, situated about 300 feet from the shoreline, that has been leveled and filled with dredge spoilings by the Port of Kalama (Figures 4.2-11 and 4.2-12). Geotechnical tests confirm the presence of fill to depths of 10 to 15 feet throughout the plant site. The subject property was undeveloped bottomland until 1979, when the Port purchased the property and began filling it in with dredged sediments from the Columbia River. Surrounding properties to the north and west have remained undeveloped and used for agricultural purposes since the 1930s, while properties to the south have been developed for industrial use in the Port of Kalama (Hart Crowser 1995, 1995a). The ground surface is moderately covered with low-growing introduced weeds and grasses. Ground surface visibility was moderate to good and confirmed the presence of fill throughout the industrial site. No cultural resources were observed. Significant cultural deposits would not be expected to be identified given the extent of fill placed over the site area.

##### **Pipeline**

The proposed pipeline corridor traverses a variety of settings, and consequently, ground visibility was variable. In general, the pipeline corridor would be constructed adjacent to or within existing roadways, railways, and/or levees. Most of this corridor has been developed, and is in most places constructed of fill and covered with asphalt or gravel. Non-developed areas are limited to the proposed Kalama River crossings; intensive pedestrian survey was conducted in these areas.

A bridge was constructed circa 2000 at the Kalama River Crossing and the associated road approach is located near or within site deposits associated with 45CW5 (Figure 4.2-13). This area was investigated intensively; however, no archaeological deposits could be relocated. Ground visibility in the site area was generally poor given the amount of dense grass vegetation, with the exception of the immediate Kalama River shoreline. Silt deposits were visible on the ground surface. The area appears to be frequently inundated; it may be that potential archaeological materials have been buried by flood events.

South of the bridge, which includes a raised fill bed for the road approach, the development would follow an existing levee along the south bank of the Kalama River until reaching Hendrickson Drive. The levee was constructed in the 1970s (Mark Wilson, personal communication) and is therefore not considered to be of historic age. No cultural resources were noted along the levee during reconnaissance.

The pipeline would parallel paved Hendrickson Drive and the BNSF/UP Railroad, located immediately east of the road; both are constructed on a raised, fill levee about 10 to 12 feet in height. Archaeological sensitivity appears low for the remainder of the pipeline corridor south of the Kalama River. Occasional cutbank exposures were examined along the Columbia River shoreline where Hendrickson Drive is closest to the water's edge. No cultural resources were noted.



Figure 4.2-11. Overview of the proposed PMEC site, facing southwest toward the Columbia River.



Figure 4.2-12. Overview of the proposed PMEC site, facing south toward the existing industrial area at the Port of Kalama.



Figure 4.2-13. The proposed Kalama River crossing, as viewed from the reported site of 45CW5 (foreground). The pipeline would be bored beneath the river in this area if this alternate were selected.

#### **4.2.5.6 Impacts**

##### **PMEC Site**

The proposed PMEC would be located in an area that has undergone considerable modern disturbances, including the placement of dredge spoils and grading. The presence of dredge spoils to depths of 10 to 15 feet precludes efforts for shovel testing of native soils where *in situ* archaeological deposits would be most likely to occur. No previously recorded sites are located in this area. Modern industrial development has likely impacted any potentially significant resources within the PMEC site. However, it is possible that deeply buried archaeological deposits may still be present underneath the fill material. If proposed construction of the PMEC would not exceed the depth of the fill, then no further investigations are recommended. Should development components include substantial disturbance to native soils, additional efforts are recommended given the archaeological sensitivity of the Columbia River, and the historic record, which demonstrates considerable use of the area near the Kalama River confluence with the Columbia River. Such efforts may include mechanical trench excavation prior to construction, archaeological monitoring during construction, and/or implementation of an Unanticipated Discovery Plan during construction.

##### **Pipeline**

Subsurface probing is recommended in the vicinity of the Kalama River along the alignment for the proposed gas pipeline if development components cannot avoid impacts to native soils. Two important prehistoric archaeological sites have been documented nearby the proposed pipeline river crossings. Furthermore, the historic record provides several accounts documenting the presence of at least two villages at the mouth of the Kalama River. If construction of the

proposed pipeline, including ancillary activities such as bore entrance/exit pits and equipment staging areas, would occur outside of areas of previous disturbance, such as existing roadbeds, levees, bridges, or railroads, then subsurface investigations are recommended given the cultural sensitivity of the area, as well as the dense ground vegetation that precluded site identification during surface survey.

If the project components were not confined to areas of previous disturbance, archaeological site 45CW5, located on the south side of the Kalama River, would require evaluation, application of the Criteria of Effect to determine impacts to the site, and possible mitigation. Subsurface reconnaissance probing is recommended for the north side of the Kalama River at the West Alternate Kalama River Crossing given the cultural sensitivity of the immediate vicinity, if appropriate areas are identified that exhibit limited prior disturbance.

#### **4.2.5.7 Mitigation Measures**

If the pipeline cannot be feasibly constructed completely within areas of previous disturbance, mitigation measures would be implemented. These measures may include, but are not limited to, site avoidance, subsurface reconnaissance probing, site evaluation, data recovery, and monitoring during construction.

### **4.2.6 AGRICULTURAL CROPS/ANIMALS**

#### **4.2.6.1 Existing Conditions**

The PMEC site, natural gas pipeline, and railroad spur would be on lands that have not historically been farmed or supported grazing animals. See Section 4.2.5.5 for more details. Site soils are comprised of Caples silty clay loam, Maytown silt loam, and Riverwash. See Section 3.1 for soil descriptions.

#### **4.2.6.2 Impacts**

There would be no impacts to agricultural crops and animals.

#### **4.2.6.3 Mitigation Measures**

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## 4.3

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### WAC 463-60-372 Built environment—Transportation.

- (1) Transportation systems. The application shall identify all permanent transportation facilities impacted by the construction and operation of the energy facilities, the nature of the impacts and the methods to mitigate impacts.*
- (2) Vehicular traffic. The application shall describe existing roads, estimate volume, types, and routes of vehicular traffic which will arise from construction and operation of the facility. The applicant shall indicate the applicable standards to be utilized in improving existing roads and in constructing new permanent or temporary roads or access, and shall indicate the final disposition of new roads or access and identify who will maintain them.*
- (3) Waterborne, rail, and air traffic. The application shall describe existing railroads and other transportation facilities and indicate what additional access, if any, will be needed during planned construction and operation. The applicant shall indicate the applicable standards to be utilized in improving existing transportation facilities and in constructing new permanent or temporary access facilities, and shall indicate the final disposition of new access facilities and identify who will maintain them.*
- (4) Parking. The application shall identify existing and any additional parking areas or facilities which will be needed during construction and operation of the energy facility, and plans for maintenance and runoff control from the parking areas or facilities.*
- (5) Movement/circulation of people or goods. The application shall describe any change to the current movement or circulation of people or goods caused by construction or operation of the facility. The application shall indicate consideration of multipurpose utilization of rights of way and describe the measures to be employed to utilize, restore, or rehabilitate disturbed areas. The application shall describe the means proposed to ensure safe utilization of those areas under applicant's control where public access will be granted during project construction, operation, abandonment, termination, or when operations cease.*
- (6) Traffic hazards. The application shall identify all hazards to traffic caused by construction or operation of the facility. Except where security restrictions are imposed by the federal government the applicant shall indicate the manner in which fuels and waste products are to be transported to and from the facility, including a designation of the specific routes to be utilized.*

[Statutory Authority: RCW 80.50.040 (1) and (12). 04-21-013, amended and recodified as § 463-60-372, filed 10/11/04, effective 11/11/04. Statutory Authority: RCW 80.50.040. 92-23-012, § 463-42-372, filed 11/6/92, effective 12/7/92.]

## SECTION 4.3 TRANSPORTATION (WAC 463-60-372)

Construction and operation of the proposed PMEC would affect transportation and traffic in the site area. Transportation issues would include construction traffic on roads (workers, equipment, and material deliveries by truck), delivery by rail or river of large power plant components, and PMEC operation traffic (employees, visitors, deliveries of materials, and supplies). Types of transportation addressed in this section will include road, rail, river, and air transport.

### 4.3.1 EXISTING CONDITIONS

#### 4.3.1.1 Regional and Site Area

The PMEC would be located in an area within the North Marine Industrial Park at the Port of Kalama. The Port of Kalama is designated heavy industrial and is located north of the City of Kalama, within Cowlitz County, Washington. The development site is located on the east bank of the Columbia River. (See Figure 2.1-2 in Section 2.1.) The Burlington Northern Santa Fe (BNSF) rail lines lie immediately to the east of the site, between the site and Interstate-5 (I-5). The rail lines are contracted for use by BNSF, Union Pacific (UP) and Amtrak. Roadway, air, rail, and river transportation are available in the regional and site area surrounding the PMEC site. The Port of Kalama site is designated and included in the regional plan for industrial transportation oriented developments.

#### Roadway Transportation

The existing roadway system in the site area is shown on Figure 2.1-2. The roadways potentially affected by the proposed PMEC include:

- **Interstate 5** – I-5 is the primary interstate route in Washington State from Portland, Oregon to the Canadian border. This north-south freeway provides a minimum of four travel lanes (two in each direction), with six travel lanes in the project area. The freeway and adjacent BNSF rail lines are located along the eastern boundary of the site, with interchange access via West Kalama River Road at MP32.
- **West Kalama River Road** – West Kalama River Road is an east-west, two-lane county road that originates in the North Marine Industrial Park, intersects with I-5, and extends eastward into largely undeveloped rural areas east of the freeway. The posted speed limit in the vicinity is 30 MPH.
- **Tradewinds Road** – Tradewinds Road is a two-lane private road that runs between the BNSF tracks and the PMEC site providing primary access to and from West Kalama River Road. The intersection with West Kalama River Road is approximately 1500 feet east of the I-5 interchange. Tradewinds Road extends north and west around the PMEC site (a distance of approximately 3,500 feet from West Kalama River Road to Eastwind Road).

- **Hendrickson Drive** - Hendrickson Drive is a two-lane county road that extends south from West Kalama River Road across the Kalama River, providing local north-south service for industrial areas between I-5 and the Columbia River in the vicinity.

### ***Existing Traffic Volumes***

Average annual daily traffic (AADT) data for I-5 was obtained from the Washington State Department of Transportation (WSDOT) and is estimated at approximately 60,000 vehicles per day (vpd). Traffic data was not available for the I-5 ramps. Automatic traffic count data for West Kalama Road, west of the I-5 interchange (conducted in 2000 at the BNSF overpass) was obtained from Cowlitz County (2000). The results show relatively low traffic activity with an AADT of approximately 700 vpd. Weekday daily volumes were slightly higher at approximately 800 vpd.

Utilizing the typical industrial use activity along West Kalama River Road, peak hour directional volumes were developed as shown on Table 4.3-1. The traffic levels conservatively assume peak hour activity at 20% of daily volumes and directional flows at 80/20.

**TABLE 4.3-1  
EXISTING TRAFFIC VOLUMES, 2000**

Location	Traffic Volumes	
	AM Peak (7:00 – 9:00 am)	PM Peak (4:00 – 6:00 pm)
W. Kalama River Rd – eastbound	35	125
W. Kalama River Rd – westbound	125	35
Tradewinds Rd. – northbound	Neg	Neg
Tradewinds Rd. – southbound	Neg	Neg

### ***Existing Level of Service***

Level of Service (LOS) is an estimate of the performance efficiency and quality of a roadway as established by the Transportation Research Board's (TRB) *Highway Capacity Manual* (2000) methodology. The TRB methodology measures the degree of delay at intersections using the letter rating "A" for the least amount of congestion and letter rating "F" for the most amount of congestion, as shown in Table 4.3-2.

**TABLE 4.3-2  
TRB RATING SYSTEM: LEVEL OF SERVICE AND DELAY FOR UNSIGNALIZED INTERSECTIONS**

Level of Service	Expected Traffic Delay
A	≤ 10 seconds
B	> 10 – 15 seconds
C	> 15 – 25 seconds
D	> 25 – 35 seconds
E	> 35 – 50 seconds
F	> 50 seconds

Source: TRB, 2000.

Input for the LOS analysis of the unsignalized intersection of West Kalama River Road and Tradewinds Road/Hendrickson Drive utilized geometric information such as number of lanes, width, configuration and grade based on collected field data. This was combined with the existing traffic data to perform LOS analysis. The Highway Capacity Software (HCS) 2000 Release 4.1a, that is used in conjunction with the TRB *Highway Capacity Manual*, was used to calculate LOS.

The results of the LOS analysis show LOS A under existing 2000 conditions for the unsignalized intersection, representing little or no delay for all travel directions. Analysis of critical turning movements (left turns) for stopped vehicles from Tradewinds Road show little or no delay (approximately 10 seconds), resulting in LOS A/B. An LOS of C or better is typically considered to be acceptable for a rural setting and is the LOS standard for Cowlitz County.

### ***Estimated Future Traffic Volumes***

The PMEC is expected to begin operation by 2012. Traffic volumes in 2012 without the PMEC were estimated for the site area, based on the assumption that background traffic volumes would increase 2.5 percent (linear) annually between 2000 and 2012. The growth factor of 2.5 percent per year was based on historical traffic data obtained from WSDOT and anticipated general increases for this area of Cowlitz County.

**TABLE 4.3-3  
ESTIMATE FUTURE TRAFFIC VOLUMES WITHOUT PMEC, 2012**

Location	Traffic Volumes	
	AM Peak (7:00 – 9:00 am)	PM Peak (4:00 – 6:00 pm)
W. Kalama River Rd – eastbound	45	162
W. Kalama River Rd – westbound	163	46
Tradewinds Rd. – northbound	Neg	Neg
Tradewinds Rd. – southbound	Neg	Neg

### ***Estimated Future Level of Service***

The LOS analysis for future conditions was conducted using the same methodology that was used for existing LOS conditions. Results of the LOS analysis for 2012 conditions without the PMEC show that turning movements at the West Kalama River Road/Tradewinds Road/Hendrickson Drive intersection would continue to experience little delay, even with the assumed growth in background auto and truck traffic.

### **Rail Transportation**

The BNSF Railway operates a rail mainline that extends along the eastern limit of the site area. This line is a major link that ties the important industrial areas of Vancouver BC, Seattle-Tacoma to Portland, the North central states of the US, and eastern railroads via Chicago. The line is also used by Union Pacific RR to tie their network between Portland OR and Tacoma WA, and by Amtrak. Approximately 60 trains per day travel through the Port of Kalama.

## **River Transportation**

River transportation in the site area includes barge and boat/shipping transport on the Columbia River. The site is located on the east bank of the Columbia River, which runs from south to north (and towards the Pacific Ocean) in this part of the state. The Port of Kalama is committed to enhancing the marine business at the PMEC and adjacent site and encourages barge or ship transportation.

## **Air Transportation**

Air transportation in the regional area includes the Portland International Airport, within a 40 minute drive south via I-5.

### **4.3.1.2 Proposed Action**

#### **PMEC Site**

Tradewinds Road is a paved, local roadway that extends north from West Kalama River Road and provides primary vehicle access to the PMEC site. The site will also have operating access to the BNSF rail and an expanded dock on the Columbia River.

#### **Pipeline Route**

The proposed natural gas pipeline would be approximately 5 miles in length and would extend from the PMEC site south to the Deer Island Natural Gas Pressurization Station near Exit 27 on the west side of I-5 (refer to Figure 2.1-2). The gas pipeline would be located within existing pipeline right-of-way and would be directionally drilled under the Kalama River or hung on the Hendrickson Drive bridge over the Kalama, then follow the dike/walking path along the Kalama River. The pipeline would travel within Port land and under or along side Hendrickson Drive; the adjacent land use is predominantly industrial, with a section of park including a marina.

#### **Railroad Spur**

One or more rail sidings or spurs will be needed to connect the PMEC rail loop to the Burlington Northern Santa Fe and Union Pacific joint rail line. These spurs would be constructed, resulting in a total of about 15,800 lineal feet of new railroad track. The loop track would circle the development site and promote efficient unloading with less impact to the area. The proposed spur new spur connections will result in one or more new crossings of Tradewinds Road within the development site.

### **4.3.2 IMPACTS**

#### **4.3.2.1 Methodology**

To determine potential transportation impacts, Cowlitz County staff were consulted to understand existing conditions and concerns. Areas or intersections analyzed and discussed in this section were included because they would have the greatest potential impact from the PMEC construction and operation. Through the data analysis it was also determined which location

would have the greatest potential impact (the West Kalama River Road/Tradewinds Road/Hendrickson Drive intersection) and that other locations would have less or no significant impact. Data was not available for the I-5/West Kalama River Road interchange. Impacts were considered high (significant) if they would result in any of the following three criteria:

- A decrease in LOS to below the Cowlitz County standard of LOS C at a given intersection after mitigation
- Unmet parking needs
- New or significant traffic volume crossing the BNSF railroad tracks

Impacts would be moderate if the project would result in a modest change to traffic volumes, patterns, or LOS. Impacts would be low if the project would result in no noticeable change to traffic volumes, patterns, or LOS.

#### **4.3.2.2 PMEC Site and Access Road**

##### **Construction**

PMEC construction activities would last approximately 4 years and result in increased traffic activity in the site area and around the PMEC site due to workers and equipment delivery trucks arriving and departing. Traffic delays could occur due to the maneuvering of large vehicles carrying heavy loads and from additional vehicles on West Kalama River Road and Tradewinds Road. On average, approximately 400 workers would work at the PMEC site during construction.

Access to the site during construction would be provided by Tradewinds Road, connecting to West Kalama River Road and the I-5 interchange as shown on Figure 2.1.2.

In addition, large pieces of equipment may be delivered to the site by rail or river transport. The large equipment (i.e., turbines, HSRG parts, etc.) would be off-loaded onto trucks at an off-load platform for transport within the site. Timing of travel of the shipments would be coordinated with BNSF and the Port of Kalama. Anticipated impacts to rail or river transportation would be low. It is not expected that local or regional airports would be used for transporting construction equipment or material; therefore, no air transportation impacts would be anticipated.

Peak construction activity is estimated to last 12 months of the 4-year construction period, and would require approximately 1400 construction workers on a daily basis. Typically, some carpooling would occur for these trips. Assuming average vehicle occupancy of 1.3 workers per vehicle, approximately 1500 daily vehicle-trips are anticipated (ITE 1997). Daily truck activity is estimated to be up to 60 deliveries per day, which would result in approximately 120 daily truck trips during this peak construction period.

It is assumed that construction traffic trips would be distributed as follows: 60 percent traveling to and from south of the site on I-5 and 40 percent traveling to and from north of the site on I-5. Many of these trips could occur outside of the peak periods, depending on their origin location and start time. Resulting peak hour traffic operations would be affected at stop-controlled intersections where higher left turn demand is expected. Short-term delays are therefore

expected during the a.m. peak at the I-5 Northbound Ramp/West Kalama River Road intersection and during the p.m. peak at the West Kalama River Road and Tradewinds Road intersection. It is anticipated that short-term construction impacts would be moderate.

I-5 is a limited access highway, which is a classification that allows for efficient travel time and increases overall safety of the I-5 corridor. Short-term, potential moderate impacts to travel safety could occur due to the turning movements of trucks onto and off of West Kalama River Road during the peak construction period. No high (significant) construction impact is anticipated.

## **Operation**

The PMEC is designed to operate continuously (24 hours a day, 7 days a week) with a workforce of approximately 80 full-time employees. The workforce allocation per each 12-hour shift (over two shifts) would be approximately 40 people.

The number of anticipated vehicle trips for the PMEC was calculated based on the reference manual *Trip Generation* (Institute of Transportation Engineers 1997) land use code 110 (General Light Industrial). The analysis assumed (worst-case) an onsite workforce slightly higher than would typically be onsite at any one time (80 employees), and that each employee would drive to work alone and therefore account for 160 daily trips (80 entering and 80 exiting). In addition, it is estimated that 40 daily trips (20 entering and 20 exiting) would be associated with service vehicles (e.g., delivery trucks or site visitors). Therefore, it was assumed that a total of 200 daily vehicle trips (100 entering and 100 exiting) would be generated by the PMEC.

The estimated 2012 traffic volumes (Table 4.3-3) serve as the baseline condition for examination of the effects of the PMEC. The distribution of operational traffic trips is expected to be the same as for construction trips: 60 percent of the trips would be to and from the south on I-5, primarily originating from the Vancouver area and 40 percent of the trips would be to and from the north on I-5.

The peak-hour trip generation would be 60 vehicle trips per hour. The a.m. peak hour would result in approximately 40 vehicles entering and 20 vehicles exiting, while the p.m. peak hour would be the reverse, with 40 vehicles exiting and 20 vehicles entering.

It is anticipated that most of the employees, delivery trucks, and site visitors to the PMEC would come from nearby areas via I-5. The interchange at West Kalama River Road would likely be used for 100 percent of the vehicle trips from the surrounding areas. These trips would be originating from employee homes or truck origination points.

To estimate future traffic volumes, the potential PMEC-generated traffic volumes were distributed onto the surrounding roadway network in accordance with the percentages noted above. Peak-hour traffic volumes include the 2.5 percent traffic growth per year and the proposed project traffic volumes (a total of 60 vehicle trips) that were calculated, and are presented in Table 4.3-4.

**TABLE 4.3-4  
ESTIMATED FUTURE TRAFFIC VOLUMES WITH P MEC, 2012**

Location	Traffic Volumes	
	AM Peak (7:00 – 9:00 am)	PM Peak (4:00 – 6:00 pm)
W. Kalama River Road - eastbound	65	202
W. Kalama River Road - westbound	203	66
Tradewinds Rd. - northbound	40	20
Tradewinds Rd. - southbound	20	40

A peak-hour LOS analysis was completed for the intersection of West Kalama River Road and Tradewinds Road. The results show that the continued small level of traffic traveling through the intersection would cause little or no perceptible change to operations. As shown in Table 4.3-5, the maximum change in average stopped delay would amount to less than 1 second for any vehicle turning movement. A low impact to roadway traffic would be anticipated attributable to P MEC operation.

**TABLE 4.3-5  
LEVEL OF SERVICE SUMMARY**

Unsignalized Intersection	Weekday Peak Hour Period	Existing Conditions		Projected 2005 Traffic Without Project / With Project			
		Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS
Tradewinds Road Southbound Left Turn	AM	9.8	A	10.7	B	11.2	B
	PM	9.8	A	10.4	B	10.9	B
W. Kalama River Rd Eastbound Left Turn	AM	7.6	A	7.6	A	7.7	A
	PM	7.4	A	7.4	A	7.4	A

Delay = Average delay per vehicle

Low impacts are also anticipated at the I-5 ramp intersections along West Kalama River Road due to the low projected traffic volumes generated by the project.

The P MEC would provide for needed parking of employees, visitors and deliveries at the site. Peak employee use is anticipated during shift overlap at the beginning and end of the day shift. Two stalls would typically accommodate visitors and deliveries. Not all deliveries would require a parking stall because deliveries would occur in different areas of the site. It is anticipated that there would be no impacts from unmet parking needs.

No use of local or regional airports would be required for P MEC operation; therefore air transportation impacts are not anticipated.

#### **4.3.2.3 Pipeline Route**

Temporary short-term impacts would be limited to the construction phase. Construction of the pipeline under or along side Hendrickson Drive and Tradewinds Road will require temporary

traffic control for needed shoulder or lane closures. Traffic delays would be short term in nature and would not cause hazards to traffic beyond those associated with typical construction projects.

It is planned that required road crossings will be made by boring under the road, thereby minimizing any potential impact to vehicle circulation.

Construction contractors will prepare a traffic control plan in conjunction with County staff to mitigate any disruptions to local traffic circulation caused by construction of the pipeline.

#### **4.3.2.4 Railroad Spur**

Temporary short-term impacts are anticipated during the construction phase. Construction of the new rail spurs will require temporary traffic control along Tradewinds Road north of West Kalama River Road. Potential impacts would be limited to construction traffic only, since the current site is vacant.

PMEC operations may require up to 150 train arrivals per year for fuel deliveries. Counting the empty return moves, the new facility would increase train traffic by approximately 6 trains per week between the Port of Kalama and Vancouver, WA. This level of rail spur activity is not anticipated to change BNSF rail operations or local roadway traffic patterns in and around the site. The amount of train deliveries will be reduced by the amount of fuel delivered by river transportation.

#### **4.3.2.5 River Transportation**

Little or no traffic impacts to roadways are anticipated during the construction phase.

PMEC operations may require up to 34 ship or barge arrivals per year for fuel deliveries. This activity is not anticipated to impact traffic operations on local roadways in and around the site. The amount of river deliveries will be reduced by the amount of fuel delivered by train transportation.

### **4.3.3 MITIGATION MEASURES**

Impacts to transportation attributable to the PMEC would be low and moderate, and therefore less than significant. Features included in the design of the proposed project that would reduce impacts include the following:

- Energy Northwest's construction contractor would provide WSDOT-approved safety signs during the construction period warning vehicles traveling along West Kalama River Road and the I-5 interchange approach ramps of upcoming truck access points.
- To the extent feasible, daily construction activity would be scheduled to avoid typical peak traffic periods, particularly for construction of the natural gas pipeline along Hendrickson Drive south of West Kalama River Road.

- Energy Northwest would promote rideshare and vanpool programs for construction workers, particularly during the 12-month peak construction period, to reduce vehicle trips.

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## 4.4

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### WAC 463-60-535 Socioeconomic impact.

*The application shall include a detailed socioeconomic impact analysis which identifies primary, secondary, positive as well as negative impacts on the socioeconomic environment in the area potentially affected by the project, with particular attention to the impact of the proposed facility on population, work force, property values, housing, health facilities and services, education facilities, governmental services, and local economy. The study area shall include the area that may be affected by employment within a one-hour commute distance of the project site. The analysis shall use the most recent data as published by the U.S. Census or state of Washington sources.*

*(1) Population*

*(2) The application shall describe the potential impact on housing needs, costs, or availability due to the influx of workers for construction and operation of the facility.*

*(3) The application shall have an analysis of the economic factors.*

*(4) The application shall describe the impacts, relationships, and plans for utilizing or mitigating impacts caused by construction or operation of the facility to the public facilities and services.*

*(5) The application shall compare local government revenues generated by the project (e.g., property tax, sales tax, business and occupation tax, payroll taxes) with their additional service expenditures resulting from the project; and identify any potential gaps in expenditures and revenues during both construction and operation of the project. This discussion should also address potential temporal gaps in revenues and expenditures.*

*(6) To the degree that a project will have a primary or secondary negative impact on any element of the socioeconomic environment, the applicant is encouraged to work with local governments to avoid, minimize, or compensate for the negative impact. The term "local government" is defined to include cities, counties, school districts, fire districts, sewer districts, water districts, irrigation districts, or other special purpose districts.*

[Statutory Authority: RCW 80.50.040 (1) and (12). 04-21-013, amended and recodified as § 463-60-535, filed 10/11/04, effective 11/11/04. Statutory Authority: RCW 80.50.040. 92-23-012, § 463-42-535, filed 11/6/92, effective 12/7/92. Statutory Authority: RCW 80.50.040(1) and chapter 80.50 RCW. 81-21-006 (Order 81-5), § 463-42-535, filed 10/8/81. Formerly WAC 463-42-620.]

## **SECTION 4.4 SOCIOECONOMIC IMPACT (WAC 463-60-535)**

This section presents an analysis of the impact of the P MEC on local socioeconomic resources. The section analyzes impacts to local population, work force, property values, housing, the local economy, health and safety facilities and services, and education facilities and services. An analysis of the impacts the P MEC would have on traffic is contained in Section 4.3 Transportation.

### **4.4.1. EXISTING CONDITIONS**

The P MEC would be located in Cowlitz County in southwestern Washington. The P MEC site is located at the Port of Kalama in unincorporated Cowlitz County, and portions of the gas pipeline would extend through City of Kalama property located within the designated Port. The area for which information is presented includes Cowlitz County, the City of Kalama, and the surrounding area, depending on the resource and the available data for that resource. Data for the State of Washington are presented for comparison.

#### **4.4.1.1 Population and Housing**

##### **Demographic Characteristics**

The population of Cowlitz County in 2005 was 95,900 individuals and represented 1.5 percent of the statewide population of 6.4 million. Table 4.4-1 presents the geographic distribution of the population within Cowlitz County, compared to the State of Washington. As shown, a greater percentage of Cowlitz County residents live in incorporated cities (58 percent) rather than unincorporated communities. Within the incorporated area, 85 percent of the population lives in the cities of Longview and Kelso, which are also the economic center of the County. The populations of the cities of Longview and Kelso represent 37 percent and 12 percent of the total County population, respectively. The P MEC site is located on Port of Kalama property, part of which is located in the City of Kalama. Approximately 1,980 people lived in the City of Kalama in 2005.

**TABLE 4.4-1**  
**POPULATION DISTRIBUTION IN THE PMEC VICINITY<sup>(a)</sup>**

<b>Jurisdiction</b>	<b>Population, April 1, 2005</b>
Cowlitz County	95,900
Unincorporated	40,290
Incorporated	55,610
Castle Rock	2,140
Kalama	1,980
Kelso	11,820
Longview	35,430
Woodland <i>part</i> <sup>(b)</sup>	4,240
Washington State	6,256,400
Unincorporated	2,438,882
Incorporated	3,817,518

(a) Source: WOFM 2006a.

(b) The remaining 90 residents of the City of Woodland are located in Clark County.

Table 4.4-2 shows the age distributions of Cowlitz County residents and State of Washington residents. Age distribution illustrates the ratio of working-age persons to younger and older residents, which affects both the supply of labor and the level and distribution of income. In Cowlitz County, 34 percent of the population is of non-working age, i.e., either age 14 or under, or age 65 and over. This percentage is slightly higher than the same measure for the state (32 percent).

**TABLE 4.4-2**  
**POPULATION AGE DISTRIBUTION IN THE PMEC VICINITY, 2005<sup>(a)</sup>**

<b>Jurisdiction</b>	<b>Age 14 and Under</b>		<b>Age 15 to 64</b>		<b>Age 65 and Over</b>	
	<b>Number</b>	<b>Percent</b>	<b>Number</b>	<b>Percent</b>	<b>Number</b>	<b>Percent</b>
Cowlitz County	19,951	20.8	63,035	65.7	12,913	13.5
Washington State	1,259,634	20.1	4,284,956	68.5	711,810	11.4

(a) Source: WOFM 2006b.

Table 4.4-3 shows that Cowlitz County, similar to the state as a whole, has slightly more women than men, and racially is predominantly white. The number of residents in Cowlitz County who live below the poverty level as a percentage of total population was higher than the same measure for the State of Washington in 2000 (Table 4.4-4).

**TABLE 4.4-3  
RACE AND SEX COMPOSITION IN THE PMEC VICINITY, 2004<sup>(a)</sup>**

Jurisdiction	Population	Sex (%)		Race (%)					
		Male	Female	White	Black	Native American	Asian and Pacific Islander	Two or More Races	Hispanic
Cowlitz County	95,300	49.6	50.4	94.1	0.6	1.6	1.5	2.3	5.2
Washington State	6,167,800	49.8	50.2	85.5	3.5	1.7	6.4	2.9	8.4

(a) Source: WOFM 2006c.

**TABLE 4.4-4  
POPULATION LIVING UNDER THE POVERTY LEVEL, 2000 <sup>(a)</sup>**

Jurisdiction	Population For Whom Poverty Level is Determined (b)	Persons Living Below Poverty Level	Percentage of Persons Living Below Poverty Level
Cowlitz County	91,364	12765	14.0%
Washington State	5,765,201	612370	10.6%

(a) Source: Census 2000a.

(b) Poverty status was determined by dividing the population living below poverty by the population for whom poverty status is determined, which excludes those living in institutional housing.

#### **4.4.1.2 Population Growth Trends**

Population growth in Cowlitz County was slower than the state during the period 2000 to 2005, but is expected to surpass the state rate during both periods 2005 to 2010 and 2010 to 2025, as shown in Table 4.4-5. The County estimated 136,114 residents in 2025, reflecting a growth rate of 1.6 percent per year on average for the period 2010 to 2025. Washington State's population is forecast to grow by approximately 1.2 million individuals, or 4.3 percent per year, between 2005 and 2010. Between 2010 and 2025, the state is expected to grow by an additional 1.3 million individuals, or 1.2 percent per year.

The City of Kalama population grew by 197 people during the period 2000 to 2005, at a rate of 2.1 percent per year. This rate was higher when compared to Cowlitz County in general, but lower when compared to the state for that period.

**TABLE 4.4-5  
POPULATION GROWTH TRENDS AND PROJECTIONS  
FOR THE P MEC VICINITY<sup>(a)</sup>**

Jurisdiction	2000 Census	2005	2000-2005		2010 Fore- cast	2005-2010		2025 Fore- cast	2010-2025	
			Number Change	Annual Average Rate of Growth		Number Change	Annual Average Rate of Growth		Number Change	Annual Average Rate of Growth
Cowlitz County	92,948	98,764	5,816	1.2%	107,903	9,139	1.8%	136,114	28,211	1.6%
City of Kalama	1,783	1,980	197	2.1%	(b)	(b)	(b)	(b)	(b)	(b)
Washington State	5.1 million	6.2 million	1.2 million	4.3%	6.6 million	0.4 million	1.3%	8.0 million	1.3 million	1.2%

(a) Sources: WOFM 2006d.

(b) Population forecasts by city are not available from the Washington State of Financial Management (Berg 2006).

#### **4.4.1.3 Housing Characteristics**

Table 4.4-6 presents housing characteristics in Cowlitz County, the City of Kalama, and Washington State from the 1990 Census and the 2000 Census. Table 4.4-6 also presents housing forecasts made by WOFM in 2002 for the years 2005 and 2010. The number of housing units that existed in the City of Kalama in 1990 (491) increased to 842 by 2000, representing an average annual rate of growth of 5.5 percent, a rate that is higher than the same rates for Cowlitz County (1.5 percent) and the state (1.9 percent). Occupancy rates declined during the 1990s, while the percentage of occupied units that were owner-occupied increased in the 1990s. During the period 2005 to 2010, average annual rates of growth in the number of housing units are expected to be 1.9 percent per year for Cowlitz County, and 1.6 percent per year for the State of Washington, indicating faster growth in the County.

**TABLE 4.4-6**  
**HOUSING CHARACTERISTICS IN THE PMEC VICINITY, 1990, 2000 (a)**

	<b>Total Housing Units</b>	<b>Occupancy Rate</b>	<b>Percent of Occupied Housing Units That Were Owner-Occupied</b>	<b>Average Household Size</b>
<b>City of Kalama (a)</b>				
1990	491	97%	57%	n.a.
2000	842	89%	64%	2.39
<b>Cowlitz County</b>				
1990 (a)	33,304	95%	62%	n.a.
2000 (b)	35,850	93%	68%	2.55
2005 (b)	38,540	n.a.	n.a.	2.53
<b>2010 (b)</b>	<b>42,392</b>	<b>n.a.</b>	<b>n.a.</b>	<b>2.51</b>
<b>State of Washington</b>				
1990 (a)	2,032,378	92%	58%	n.a.
2000 (b)	2,271,398	93%	65%	2.53
2005 (b)	2,442,435	n.a.	n.a.	2.50
2010 (b)	2,642,598	n.a.	n.a.	2.46

(a) Source: Census 1990; Census 2000b; WOFM 2006e.

Between 2000 and 2005, the population of Cowlitz County grew by approximately 1.2 percent per year, while the number of housing units in the County was expected in 2002 to grow by 1.5 percent. These rates suggest that vacancy rates have increased during this period, similar to how they increased during the 1990s, indicating relatively less demand for housing. Also for the period 2000 to 2005, average household sizes are expected to decrease in Cowlitz County and the State of Washington as a whole. Housing prices in Cowlitz County are lower when compared to some other areas in Washington State (Table 4.4-7). Median gross rent is 22 percentage points lower in the County when compared to the state, and median housing value is 23 percentage points lower in the County when compared to the State.

**TABLE 4.4-7**  
**HOUSING VALUES, 2000 (a)**

<b>Jurisdiction</b>	<b>Median Gross Rent</b>	<b>Median Value for Owner-Occupied Housing Units</b>
Cowlitz County	\$518	\$129,900
Washington State	\$663	\$168,300

(a) Source: Census 2000c.

To the east of the proposed PMEC site, beyond Interstate 5 and the BNSF railroad tracks, the closest residences are along Old US Highway 99, approximately 0.5 mile from the site. These homes are likely between 15 and 25 years old. Old Highway 99 runs along the bottom of a hillside, beneath and west of Bluff Road. Bluff Road has several newer homes, which appear to have been built in the last few years. The houses overlook the proposed PMEC site, and are located approximately one mile from the site.

## Temporary Lodging

Approximately 650 hotel rooms and 555 RV campsites exist within 12 miles of the proposed PMEC site (Table 4.4-8). Another 241 hotel rooms and 908 RV campsites are located between 12 and 36 miles from the site. In total, 891 hotel rooms, 1,463 RV camping sites, and 92 RV campsites/motel rooms exist within 36 miles of the site. This total does not include any lodging facilities in Portland, which is approximately 40 miles south of the site. Assuming average occupancy rates of 70 percent, a minimum of 362 hotels rooms and 372 RV campsites are available at any one time.

**TABLE 4.4-8  
TEMPORARY LODGING UNITS (a)**

Type of Lodging	Units within 12 Miles of PMEC Site	Units 12-36 Miles from PMEC Site	Total Units
Hotel or Motel	650	241	891
RV Camping	555	908	1,463
RV Camping/Motel	-	92	92
Total Units	1,205	1,241	2,446
Units Available Assuming 70% Occupancy	362	372	734

(a) Sources: Woodall 2006; TravelWashington 2006.

### 4.4.1.4 Employment and Income

The sources of income and types of employment in an area often provide the most comprehensive indicators of the health and direction of the local economy. To a large extent, these factors also play a part in determining the overall welfare and quality of life of the individuals inhabiting the area. Table 4.4-9 presents 2004 income and employment levels for Cowlitz County. The major employers in the region surrounding the PMEC site include those listed in Table 4.4-10 (WSP 2006).

In 2004, employment in Cowlitz County averaged 3.6 million jobs, of which 3.0 million (82 percent) were held by wage and salary workers and 0.7 million (18 percent) by proprietors. Place of work earnings (wages, salaries and proprietors' earnings) accounted for about three-fifths of total personal income in the County, with income from property (dividends, interest and rent) and transfer payments (mainly Social Security) making up the balance. The principal sources of employment were government, retail trade, and health care and social assistance.

Immediately to the south of the proposed PMEC site is Steelscape, a manufacturer of steel coil. The remainder of the Port of Kalama is primarily in industrial use, with several lumber operations, a rail yard, a large grain elevator and a chemical company. There are also some small recreational areas within the Port property. East of the site, between Interstate 5 and Old Highway 99, land is primarily industrial, rural residential, or forest. Businesses on Port of Kalama property include a gas station and a drive-thru espresso stand, located at the corner of Oak Street and Hendrickson Drive. The proposed site itself is vacant land, void of any economic activity. Over 1,000 employees currently work at the Port of Kalama.

**TABLE 4.4-9  
EMPLOYMENT AND INCOME DATA FOR COWLITZ COUNTY, 2004**

Sector	Employment		Personal Income Earnings	
	Jobs	%	\$ '000	%
Total employment	3,620,312	100.0%	\$ 2,433,903	100.0%
Wage and salary employment	2,957,913	81.7%	\$ 1,301,506	53.5%
Proprietors employment	662,399	18.3%	\$ 172,140	7.1%
Farm employment	81,581	2.3%	\$ 13,392	0.6%
Nonfarm employment	3,538,731	97.7%	\$ 1,789,974	73.5%
Private employment	2,944,579	81.3%	\$ 1,523,414	62.6%
Forestry, fishing, etc.	50,209	1.7%	\$ 47,775	3.1%
Mining	5,901	0.2%	\$ 8,281	0.5%
Utilities	4,728	0.2%	(D)	-
Construction	221,655	7.5%	\$ 204,318	13.4%
Manufacturing	279,653	9.5%	\$ 493,318	32.4%
Wholesale trade	132,028	4.5%	(D)	-
Retail trade	397,312	13.5%	\$ 144,039	9.5%
Transportation and warehousing	103,316	3.5%	\$ 78,233	5.1%
Information	101,698	3.5%	\$ 19,028	1.2%
Finance and insurance	144,736	4.9%	\$ 49,156	3.2%
Real estate and rental and leasing	145,914	5.0%	\$ 15,920	1.0%
Professional and technical serv.	234,837	8.0%	\$ 41,687	2.7%
Management	34,060	1.2%	\$ 2,140	0.1%
Administrative and waste services	180,482	6.1%	\$ 24,047	1.6%
Educational services	59,362	2.0%	\$ 6,655	0.4%
Health care and social assistance	342,368	11.6%	\$ 207,254	13.6%
Arts, entertainment, and recreation	83,908	2.8%	\$ 13,446	0.9%
Accommodation and food services	229,405	7.8%	\$ 44,134	2.9%
Other services	193,007	6.6%	\$ 55,426	3.6%
Government	594,152	16.4%	\$ 266,560	11.0%
(D) = Number is not disclosed in order to protect firms' privacy.				

Source: BEA 2006.

**TABLE 4.4-10  
MAJOR EMPLOYERS IN COWLITZ COUNTY**

<b>Company</b>	<b>Employees</b>
Longview Fibre Company	1755
PeaceHealth/St John Medical Center	1605
Weyerhaeuser	1500
Longview School District	941
J.H. Kelly	900
Kelso School District	900
Foster Farms	850
Lower Columbia College	745
Safeway	553
Cowlitz County	550
NORPAC	447
City of Longview	325
Steelscape	305
WalMart	301
Kaiser Permanente	300
Fred Meyer	250
RSGForest Products	238
PNE Corporation	225
Koelsch Senior Communities	200
Noveon Kalama	158
Cadillac Ranch Casino & Entertainment	150
Columbia Analytical Services	140

#### **4.4.1.5 Public Services and Utilities**

##### **Fire Protection**

Two municipal fire departments (City of Longview and City of Woodland) and seven Cowlitz County fire districts provide fire protection to Cowlitz County residents. Cowlitz County Fire District No. 5 (CCFD5) would provide fire protection and emergency response to both the P MEC site on Port of Kalama property and unincorporated Cowlitz County land, and the gas pipeline, which crosses the City of Kalama property. Both the site and the pipeline route are within the jurisdictional boundaries of CCFD5 (Leatzow 2006; Headley 2006).

CCFD5 provides both fire and emergency medical services from three stations located near Kalama to a service area of 36 square miles and over 5,000 residents. CCFD5 responds to approximately 700 emergency incidents per year. Specific services provided by CCFD5 include fire control and prevention services, public education, advanced life support emergency medical services, vehicular rescue, marine fire control and rescue, and technical rescue (CCFD5 2006; Leatzow 2006).

Staff at CCFD5 includes approximately 26 volunteers, seven part-time firefighters/paramedics, three staff firefighters/emergency medical technicians, three staff firefighters/paramedics, one staff administrative secretary, one part-time administrative assistant, and one staff Chief. CCFD5 has three class 1 fire engines, one medium rescue unit, two tenders, two advanced life support ambulances, two brush engines, one fire boat, one support vehicle, and two command units. CCFD5 is licensed by the State of Washington as an advanced life support trauma verified service (CCFD5 2006; Leatzow 2006).

Fire Station No. 51 is the closest station of the three CCFD5 stations to the proposed PMEC site and is located at 382 N.E. Frontage Road in the City of Kalama (approximately four miles south of the site). Fire Station No. 52 is located at 415 Todd Road (six miles south of the site), and Fire Station No. 53 is located at 126 Mountain View Road (approximately 6 to 8 miles east of the site, accessible by backroads) (Leatzow 2006).

The CCFD5 average response time for all calls in 2005, including the 29 percent of calls that were out-of-jurisdiction, i.e., mutual aid calls, was 10 minutes 12 seconds. For 2006 as of June 5, average response time for all calls was 10 minutes 9 seconds. Expected response time for the higher emergency medical calls is approximately four minutes, and expected response time for the higher emergency fire calls is approximately seven or eight minutes, depending on time of day and availability of volunteer responders. Cowlitz County has a countywide automatic mutual aid agreement in place with all nine fire departments or agencies (Leatzow 2006).

CCFD5 also provides ambulance services at the Advanced Life Support (ALS) level. Second responders for ambulance service would be Cowlitz County Fire District No. 2 Fire and Rescue, located in Kelso (also an ALS-level provider), American Medical Response (a private ALS-level service provider), and Cowlitz County Fire District No. 6 located in Castle Rock. Cowlitz County Fire District No. 6 has one transporting ALS unit. Beyond these three agencies, Clark County and Lewis County would provide ambulance service. Table 4.4-11 presents staffing and equipment for these fire departments.

**TABLE 4.4-11  
FIRE DEPARTMENTS IN THE PMEC VICINITY(a)**

<b>Fire Department</b>	<b>Paid Full-Time Personnel</b>	<b>Volunteer Personnel</b>	<b>Equipment</b>	<b>Protection Class<sup>(b)</sup></b>
Cowlitz County Fire District No. 5	16	26	2 – advance life support ambulances 2 – command vehicles 3 – class 1 engines 1 – medium rescue unit 2 – tenders 1 – support vehicle 2 – brush engines 1 – fire boat	8
Cowlitz 2 Fire and Rescue (Kelso)	26	100	8 – engines (first and reserve response) 4 – squad (EMS/wildland response) 3 – tenders 3 – medic vehicles (advanced life support ambulance) 1 – aid (EMS response) 1 – brush (wildland response) 1 – tower (fire engine - 55' rescue truck) 2 - service Trucks	6
Cowlitz County Fire District No. 6 (Castle Rock)	14	64	3 – engines 1 – squad 1 – tenders 3 – medic units 1 – rescue 1 – paramedic response unit 1 – antique engine	6

(a) Leatzow 2006; CFR 2006; CCFD6 2006.

(b) WSRB 2006. As rated by the Washington Surveying and Rating Bureau. The Bureau rates the level of fire protection provided by fire departments against four main elements: available water supply; logistical characteristics and makeup of the district fire department; available communications systems; and finally fire control and safety measures taken and ordinances in effect in the particular fire district. Ratings are used to evaluate fire protection availability for insurance purposes. Ratings range from 1 to 10, with class 1 representing the highest level of fire protection and class 10 the lowest level.

## **Law Enforcement**

Law enforcement agencies with a presence near the proposed PMEC site and the proposed location for the gas pipeline include the Cowlitz County Sheriff's Department (CCSD), the City of Kalama Police Department (KPD), the Washington State Department of Fish and Wildlife (WDFW), and the Washington State Patrol (WSP). The Port has a contract with Pacific Northwest Security to provide security on Port property.

Law enforcement agencies whose jurisdictions include the PMEC site and area where the gas pipeline would be constructed include both the CCSD, because the site is on unincorporated Cowlitz County property and the KPD because the gas pipeline extends through incorporated City of Kalama property.

The CCSD is responsible for serving the unincorporated areas of Cowlitz County, including the proposed PMEC site and the portion of the gas pipeline in unincorporated Cowlitz County. This department has a total of 45 deputies (commissioned officers), including 24 patrol officers and four patrol sergeants. Response times to calls from the site vicinity would vary, depending on shifts, patrol locations, and the type of call. Two to five officers are on duty 24 hours per day,

seven days per week. Patrols operate on a call-by-call basis; therefore, no regular patrol routes are assigned, although officers patrol the site area once or twice per shift, on average. Headquarters are located at the Hall of Justice, 312 Southwest 1st Avenue in Kelso (Mahoney 2006).

All 39 Washington State county sheriffs sign a mutual aid agreement annually. Other law enforcement agencies are in the process of putting together a mutual aid response. CCSD and the KPD assist with calls within each other's jurisdictions when needed (Mahoney 2006).

CCSD resources are generally adequate to serve the PMEC during construction and operation, given that Pacific Northwest Security provides onsite security at the Port of Kalama. CCSD has the resources to serve the PMEC at the peak of construction (1,400 workers), when additional calls for service are likely (Mahoney 2006).

KPD is responsible for traffic enforcement, patrol, response to emergency calls, and community protection. Staff includes one police consultant, one sergeant, three officers, and one clerk. Equipment includes one patrol car and one patrol SUV. The KPD is located at 385 N. First Street, approximately six miles south of the proposed PMEC site, and less than one quarter mile from where the gas pipeline extends in a north-south direction (KPD 2006).

The WDFW owns property along the Kalama River south of the Steelscape property. The property is used for recreational purposes and includes a boat launch for small boats. WDFW officers are frequently present near the PMEC site (Mahoney 2006).

The Vancouver District (No. 5) of the WSP would provide police services to Interstate 5 near the proposed PMEC site, but would not respond to calls for service at the Port of Kalama. The WSP Vancouver District includes the five counties located in southwest Washington: Clark, Skamania, Klickitat, Cowlitz, and Lewis. In addition to the district office located in Vancouver, four detachment offices are located in Chehalis, Morton, Kelso, and Goldendale. The detachment closest to the PMEC site is the Kelso detachment, for which the patrol area begins 21 miles north of Portland, Oregon and 145 miles south of Seattle along I-5 (WSP5 2006).

The Kelso detachment has 17 commissioned officers, and serves the Cowlitz County population. WSP Vancouver District has approximately 60 commissioned officers, and serves the population living in Cowlitz, Lewis, Clark, Klickitat, and Skamania counties (Moe 2006). Table 4.4-12 shows that the staffing level per capita for the KPD are higher than average in Washington State, while the staffing level per capita for the CCSD is lower than average.

**TABLE 4.4-12  
POLICE DEPARTMENT STAFFING LEVELS  
IN THE PMEC VICINITY**

Department	2005 Population of Service Area	Number of Commissioned Officers (a)	Ratio of Officers to 1,000 Population
City of Kalama Police Department	1,980	4	2.0
Cowlitz County Sheriff's Department	40,290 (b)	45	1.1
Washington State Patrol District 5 Kelso Detachment	95,900	17	0.2
Washington State Patrol Vancouver District 5	569,300 (c)	60	0.1
Average for Washington State	-	-	1.7 (d)

(a) KPD 2006; CCSD 2006; WSP5 2006.

(b) Unincorporated Cowlitz County.

(c) Includes population of Clark, Cowlitz, Lewis, and Skamania counties.

(d) WASPC 2006. Reserve officers are not factored into this ratio.

### Emergency Medical Services

Emergency medical services are provided near the proposed PMEC site by primary response ambulance units and the area hospital. First response ambulance units are operated through Cowlitz County Fire District No. 5. The primary responsibility of the fire department is to provide basic life support and to prepare the victims for transport. Second responders to the PMEC site in response to a call for ambulance service would be Cowlitz 2 Fire and Rescue in Kelso and American Medical Response. Table 4.4-13 lists characteristics of the first and second response ambulance service providers for the PMEC site.

**TABLE 4.4-13  
AMBULANCE SERVICE PROVIDERS IN THE PMEC VICINITY**

Name	Ownership	Level of Care <sup>(a)</sup>
Cowlitz County Fire District #5	Public	ALS
Cowlitz 2 Fire and Rescue (Kelso)	Public	ALS
American Medical Response	Private	ALS

(a) ALS = Advanced Life Support.

The two hospitals in Cowlitz County are Cowlitz General Hospital in Kelso (approximately 11 miles north of the PMEC site) and Saint John Medical Center in Longview (approximately 12 miles north of the site). Saint John Medical Center has 198 beds, and is a short term acute care facility providing cardiovascular, orthopedic, emergency, radiology, nuclear medicine, imaging, neurosciences, oncology, and special care services. Southwest Washington Medical Center is a regional care facility located in Vancouver, Washington, approximately 31 miles south of the PMEC site. Oregon Health Science Medical Center and Providence St. Vincent Medical Center are located approximately 40 miles south of the PMEC site, in Portland.

### Schools

The PMEC site is located on the boundary between the Kalama School District (SD) and the Kelso School District. Neither Kalama SD nor Kelso SD was certain about where the boundary

between these two districts lies, and in which district the PMEC site is located (KSDG 2006; KESD 2006). This section presents information about both districts.

Kalama SD No. 402 headquarters and schools are located on one campus, at 548 China Garden Road in Kalama, approximately four miles south of the PMEC site. Kalama SD includes one elementary school, a combined high school and middle school, and an annex where some middle school and elementary school children attend classes. Enrollment in October of the 2005-2006 school year was 1,034 students (WOSPI 2006).

The Kelso SD No. 458 operates seven elementary schools, two middle schools, and two high schools, and is headquartered at 601 Crawford Street in Kelso (KESDW 2006). All Kelso SD schools are in the City of Kelso, which is located approximately 11 miles north of the PMEC site. Enrollment in October of the 2005-2006 school year in the Kelso School District was 5,243 students (WOSPI 2006).

No school buildings are located within three miles of the PMEC site, although school buses may drive through the neighborhoods that are located between 0.5 and 1.0 mile from the site. Higher education is available within the County from Lower Columbia College in Longview. Other nearby higher education providers included Portland State University, University of Portland, Washington State University (Vancouver campus), Clark College (Vancouver), Oregon Health Science University (Portland teaching hospital), and Providence St. Vincent Medical Center (Portland teaching hospital).

## **Parks and Recreational Facilities**

Parks and other recreational facilities are discussed in detail in Section 4.2 Land and Shoreline Use.

## **Utilities**

Telephone service to the site is provided by Kalama Telephone. The existing communications infrastructure located at the Port of Kalama is expected to be adequate to handle the anticipated needs of the PMEC during construction and operation. Should upgrades to this infrastructure be required, the PMEC proponent would either complete these upgrades, or provide funds to the communications service provider for completion of these upgrades.

Potable water is available at the PMEC site from the City of Kalama municipal domestic supply. The City of Kalama provides water service to approximately 3,000 people inside and outside the city limits. The source of water is a Ranney well adjacent to the Kalama River. The City of Kalama is currently using its well field (along with thirteen water storage reservoirs) to satisfy all of the water demands of its system. The present municipal water supply should be enough to handle growth through the year 2016, at which point the water treatment plant and associated water rights would need to be expanded. Detailed discussions of water supply systems and stormwater control systems at the PMEC site and in the site vicinity, as well as PMEC related impacts on these facilities, can be found in the following sections of this document:

- 2.5 - Water Supply
- 2.7 - Characteristics of Aquatic Discharge Systems
- 2.8 - Wastewater Treatment
- 2.10 - Surface-Water Runoff
- 3.3 - Water

The Port of Kalama provides sewer services to its tenants. Cowlitz County Division of Solid Waste collects solid waste at the Port of Kalama.

#### **4.4.2. IMPACTS**

This section describes the expected impact of the PMEC on local socioeconomic resources. The PMEC would generate new local employment, additional business for local service and materials providers, and additional tax revenues to Cowlitz County and the state. The overall permanent socioeconomic impact of the PMEC would be positive. Impacts were estimated through a detailed review of the proposed action against existing conditions.

##### **4.4.2.1 Construction**

#### **Local Economy**

Section 2.12 of this application provides information on the construction costs and schedule and projected manpower loading for the PMEC. Based on the anticipated permitting schedule and issuance of a Notice to Proceed, construction would begin in mid 2008 with nine months of design and site preparation. After site preparation, construction would last approximately forty months. Construction of the power island and balance of plant would be completed in 2010. Construction of the process plant would be completed in late 2011, with commercial operations beginning in the first half of 2012. During construction, the construction workforce would peak at approximately 1,400 workers over the construction period and average 400 workers over the 14 quarters. Table 4.4-14 presents the expected average composition of the construction workforce. Construction trades would be broken down as shown in Table 4.4-15.

**TABLE 4.4-14  
ESTIMATED QUARTERLY CONSTRUCTION PERSONNEL**

<b>Year</b>	<b>Quarter</b>	<b>Estimated Number of Construction Personnel</b>
2008	1	0
	2	50-100
	3	100-200
	4	150-250
2009	1	200-300
	2	600-800
	3	1,200-1,400
	4	1,100-1,300
2010	1	900-1,100
	2	1,200-1,400
	3	900-1,100
	4	405-400
2012	1	200-300
	2	100-200
	3	50-100

**TABLE 4.4-15  
AVERAGE POWER PLANT CONSTRUCTION WORKFORCE  
COMPOSITION, BY OCCUPATION**

<b>Occupation</b>	<b>Percentage Composition</b>
Boilermaker	11.7%
Carpenter	11.7%
Electrician	18.8%
Ironworker	7.0%
Laborer	7.0%
Millwright	11.7%
Operator	4.7%
Painter	2.3%
Pipefitter	23.5%
Sheetmetal	1.4%
Total	100%

Most of the construction labor force would likely be hired from the Longview-Kelso area, the Portland-Vancouver metropolitan area, and the Seattle-Tacoma metropolitan area. An estimated 10 percent of the workers would be residents of Cowlitz County, and would commute on a daily basis to and from the jobsite (Schinnell 2006). This estimate is based on the relative size of the labor force in Cowlitz County compared to larger labor forces in metropolitan areas that are slightly further away. Other construction personnel would also likely be hired from the Portland-Vancouver area (approximately 60 percent), and next from the Seattle-Tacoma area (approximately 20 percent) (Schinnell 2006). The construction workers hired from the Portland-Vancouver metropolitan area (60 percent) are expected to commute on a daily basis due to the 30-40 mile

distance to the site. The majority of workers commuting from Seattle-Tacoma would likely commute on a weekly basis, staying in RV parks and motels near the P MEC site during the workweek.

To ensure that the applicant uses the local labor pool to the greatest extent possible, construction contractors would be required to advertise positions locally and to employ local workers to the greatest extent possible. Top hiring priority for construction would be given to qualified in-county and in-state construction workers, and a prevailing wage rate would be paid. Some of the more specialized skills required for certain plant construction activities may not be available in the local or state labor pools; therefore a small percentage of the workforce may have to be brought in from outside of both Washington and Oregon states. These workers (estimated based on power plant experience at 10 percent of the workforce, or 50 individuals, depending on the phase of construction) would likely be employed for a short period of time, and would reside in motels in the P MEC area for the duration of their assignments.

The average of approximately 50 specialized out-of-state workers, and 100 weekly-commuting construction workers<sup>1</sup> would generate additional business for the operators of transient accommodations, such as motels, recreational vehicle parks, and campgrounds, as well as for other businesses near the P MEC area. Also, a portion of the construction materials and services needed for the P MEC would be procured from local vendors, thus generating additional income for local suppliers.

## **Population and Housing Impacts**

The approximately 10 percent of the P MEC construction workforce would be specialized craftsmen originating outside of Washington and Oregon would likely have relatively short assignments, so few are expected to bring their families with them when they arrive to work on the P MEC. The population increase in the P MEC area and elsewhere in Cowlitz County would therefore be limited mainly to these workers for a temporary period of time, plus, during the workweek, the non-local workers who would temporarily commute on a weekly basis from the Seattle-Tacoma area.

The total estimated number of workers requiring transient housing would be 150 (average) and 420 (peak) over the four-year construction period, assuming that all of the workers from Seattle-Tacoma would commute on a weekly basis and the specialized, temporary staff would also require lodging. These construction workers are expected to seek temporary accommodation in the general vicinity of the P MEC site, and to use motels, trailers, campers, and other forms of transient housing. Table 4.4-8 shows that over 1,200 hotel rooms or RV campsites exist within 12 miles of the P MEC site. Assuming 70 percent occupancy, approximately 362 of these units (195 hotel rooms) would be available at any one time. Assuming a worst-case scenario that workers would want hotel or motel lodging, the peak demand of 420 rooms (assuming, again a worst-case scenario that no workers would share rooms) would stress the lodging facilities within 12 miles. However, between 12 miles and 45 miles, Vancouver and Portland lodging faculties and RV campsites are available. At the very least, an additional 372 hotel rooms or RV campsites would be

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<sup>1</sup> These estimated 100 weekly commuting construction workers include those workers who live in Seattle or Tacoma.

available. Due to the PMEC site's close proximity to the Interstate 5 corridor and the Portland-Vancouver metropolitan area, and the amenities offered by a large metropolitan area such as Portland-Vancouver, a portion of the workers' temporary housing needs would likely be met in the Portland-Vancouver area. Construction of the proposed PMEC is not expected to result in a significant impact on transient accommodation availability in the PMEC area.

## **Local Business Effects**

PMEC non-salary local procurements for construction materials, services and equipment leasing associated with construction are projected to total approximately \$3 million. These procurements would augment the revenues of many construction-related businesses in Cowlitz County. In addition, the consumption spending of local PMEC workers and their households out of their wages and salaries would stimulate the retail trade and services sector of the regional economy. Total payroll costs for the PMEC construction, including fringe benefits and other labor overhead costs, are projected to be approximately \$433 million, of which approximately \$43 million is expected to be earned in Cowlitz County. A portion of that income would become household spending, and would benefit area businesses.

An analysis of the primary and secondary effects of these construction spending streams within Cowlitz County reveals that indirect and induced value added from construction would be \$18 million, and the number of indirect and induced jobs attributable to construction is 328. The total economic impacts in terms of value added and jobs are estimated to be \$74.2 million and 375 jobs. Table 4.4-16 shows the direct, indirect, and induced economic effects of construction of the PMEC in terms of its contribution to gross regional product (value added) and creation of employment (number of jobs). The estimates in this table were calculated using IMPLAN economic input-output model specific for Cowlitz County and the PMEC. Local expenditures related to PMEC construction would affect the Cowlitz County economy *directly*, through the purchases of goods and services in the region, and *indirectly*, as those purchases, in turn, generate other purchases of intermediate goods and services from related sectors of the economy. In addition, the direct and indirect increases in employment and income enhance the overall purchasing power of residents, thereby *inducing* further consumption and investment. Number of jobs is the full-time equivalent of person-years of construction employment.

## **Sales Tax Revenues**

The total cost of construction is estimated to be over \$1 billion. In addition to the local area procurements mentioned above, which would be subject to state and local sales taxes, PMEC would be purchasing large amounts of power generation and transmission-related equipment from various domestic and foreign suppliers. State use tax would be levied on these out-of-state procurements. Together with the in-state purchases of taxable goods and services, total taxable purchases would be on the order of \$867 million. The procurements would generate an estimated \$65 million in sales and use taxes for state and local jurisdictions.

The Cowlitz County sales and use tax rate is 7.5 percent, meaning that after the state government's share of 6.5 percent, the remaining 1.0 percent is divided between the County and the other incorporated communities, depending on where the purchases are made. According to the state tax code, the County government gets 15 percent of the first one percent of local sales

tax levied in incorporated areas, with the city keeping the other 85 percent of the first one percent. The County keeps all the local sales and use tax revenues for taxable purchases in unincorporated areas. These positive fiscal impacts to the cities, County and the state would be a one-time occurrence resulting from P MEC construction activities.

#### **4.4.2.1.6 Property Values**

Because the P MEC site is located in a purely industrial zone, construction activities are not likely to adversely affect property values in residential and commercial areas of Kalama.

#### **Public Services and Utilities**

The influx of construction workers into P MEC area communities on a daily and weekly basis could result in a minor and temporary increase in the demand placed on public service providers. This increase in demand could have a minor and temporary effect on local police departments, providers of emergency medical services, and local fire departments. The impact of P MEC construction on local schools would be at most minor and temporary, as few out-of-state construction workers are likely to be accompanied by families. Construction-related impacts to local utilities are also expected to be minor and temporary.

Travel times for public service providers, such as emergency vehicles, may temporarily increase due to detours and traffic controls at some pipeline road crossing locations. The needs of public service providers are considered in the traffic section, Section 4.3, Transportation. Section 5.1, Land and Shoreline Use, addresses the potential for impacts on parks and other recreational facilities. The applicant would coordinate with area service providers to ensure response times are adequate given any delays due to detours attributable to P MEC construction.

Water supply during construction of P MEC would be purchased from the Port of Kalama and the City of Kalama. Anticipated water uses include spraying roads for dust control, construction support (such as concrete curing and hydrostatic testing of equipment), and restroom facilities for the estimated 400 construction and support workers. The water demand during the construction phase of the facility is conservatively estimated at 6,000 to 10,000 gallons per day, with a peak demand of approximately 50 gallons per minute. No adverse impacts to the Port of Kalama or City of Kalama systems are expected.

**TABLE 4.4-16**  
**ECONOMIC IMPACTS OF CONSTRUCTION**

Sector	Direct Effects		Indirect Effects		Induced Effects		Total Effects	
	Total Value Added (a)	Number of Jobs	Total Value Added (a)	Number of Jobs	Total Value Added (a)	Number of Jobs	Total Value Added (a)	Number of Jobs
Ag, Forestry, Fish & Hunting	-	-	0.0	0	0.1	3	0.1	3
Mining	-	-	0.0	-	0.0	-	0.0	-
Utilities	-	-	0.0	-	0.2	1	0.2	1
Construction	56.3	48	0.0	0	0.2	2	56.5	49
Manufacturing	-	-	0.0	0	0.3	6	0.4	6
Wholesale Trade	-	-	0.1	1	0.8	9	0.9	10
Transportation & Warehousing	-	-	0.1	1	0.4	7	0.4	8
Retail trade	-	-	0.1	3	3.2	70	3.3	73
Information	-	-	0.0	0	0.3	3	0.3	3
Finance & insurance	-	-	0.1	1	0.9	9	1.0	10
Real estate & rental	-	-	0.0	1	0.6	8	0.7	8
Professional- scientific/tech svcs	-	-	0.1	3	0.3	8	0.4	10
Management of companies	-	-	0.0	-	0.0	0	0.0	0
Administrative & waste services	-	-	0.0	3	0.2	9	0.3	12
Educational svcs	-	-	0.0	-	0.1	4	0.1	4
Health & social services	-	-	0.0	-	3.7	77	3.7	77
Arts- entertainment & recreation	-	-	0.0	-	0.2	8	0.2	8
Accommodation & food services	-	-	0.0	0	1.1	49	1.1	49
Other services	-	-	0.1	1	1.0	38	1.0	40
Government & non NAICs	-	-	0.0	0	3.5	5	3.6	5
Total (b)	56.3	48	0.7	14	17.2	314	74.2	375

(a) in millions of 2006 dollars

(b) totals may not add due to rounding

#### 4.4.2.2 Operation

##### Local Economy

Operation of the PMEC would result in a positive economic impact to Cowlitz County and the state due to increased tax revenues, employment, and local expenditures. Operation of the PMEC would require 80 to 100 full-time employees working in two 12-hour shifts. Table 4.4-17 shows the labor force by type of labor during operation. Efforts would be made to hire local individuals to staff the PMEC as much as practicable.

**TABLE 4.4-17  
OPERATION STAFF BREAKDOWN**

<b>Gasification and ASU Positions</b>	<b>Number of Operating Personnel</b>
Plant manager	1
Manager, Services/Projects	1
Manager, Production	1
Production, Eng - Mechanical Reliability	3
Production Eng - Process Optimization	1
Production Eng - Air Separation	1
Control Engineer	1
Buyer	1
Accounting Clerk	1
Shift Supervisor - Production	4
Shift Supervisor - Training	1
Inventory Supervisor	1
Maintenance Supervisor	1
Environmental & Safety Controller	1
Shutdown Coordinator	1
Permit Coordinator	1
Material Controller	1
Maintenance Planner	1
Administrative Assistants	3
Laboratory Technicians	2
I/E/A Technicians	4
Operating Technicians (Level 3 - Field)	19
Operating Technicians (Level 5 - Control)	17
<b>Gasification and ASU Subtotal</b>	<b>69</b>
<b>Power Block Plant Positions</b>	<b>Number of Operating Personnel</b>
Maintenance Engineer	1
Maintenance Planner	1
I/E/A Technicians	1
Operating Technicians (Level 3 - Field)	4
Operating Technicians (Level 5 - Control)	4
<b>Power Block Total</b>	<b>11</b>
<b>TOTAL FOR PMEC</b>	<b>80</b>

The estimated gross payroll (including fringe benefits and other payroll overheads) for the operational workforce is \$12.9 million, or an average annual labor cost of \$162,000 per employee. This is approximately 40 percent higher than the standard industrial wage for this industry in Cowlitz County. In addition to the regular operational workforce, a temporary workforce with appropriate skills would be utilized during major maintenance or other non-routine operational work.

Using IMPLAN regional economic modeling software for the power generation and supply industry in Cowlitz County, a power plant employing 80 full-time workers would have a gross annual value of output valued at \$57 million, including \$25 million in purchases from suppliers (including fuels, maintenance supplies and services, retail goods and professional services). Sales, use and other indirect business taxes on that level of output are estimated at \$4 million per year, which would accrue to state and local government jurisdictions. Employee spending from wages and salaries is estimated at around \$11 million per year, assuming an average local expenditure rate of 85 percent of compensation.

Taxes to be assessed on the PMEC and associated facilities have not been determined, but could amount to several million dollars per year in view of the PMEC's projected total cost of over \$1 billion.

Table 4.4-18 shows the direct, indirect, and induced economic effects of operation of the PMEC in terms of its contribution to gross regional product (value added) and creation of employment (number of jobs). The estimates in the table were calculated using an IMPLAN economic input-output model for Cowlitz County. Expenditures related to PMEC operation would affect the Cowlitz County economy *directly*, through the purchases of goods and services in the region, and *indirectly*, as those purchases, in turn, generate other purchases of intermediate goods and services from related sectors of the economy. In addition, the direct and indirect increases in employment and income enhance the overall purchasing power of residents, thereby *inducing* further consumption and investment. Number of jobs is the full-time equivalent of person-years of employment.

## **Population and Housing Effects**

Operation would require a minimum of 80 permanent employees. For the IMPLAN model, an estimated 30 employees were assumed to originate from the local area (Cowlitz County), based on experience with other power plants. The remaining 50 employees could migrate to the area from other locations outside the County. Assuming an average household size of 2.5 persons, the population in the area could increase by approximately 125 people, and 50 households. Assuming the most recent housing vacancy rates available (2000) of 11 percent for the City of Kalama and 7 percent for Cowlitz County, approximately 90 households in Kalama and over 2,500 in Cowlitz County would be available. Also, the Portland-Vancouver metropolitan area has over 900,000 housing units with a vacancy rate of approximately 6 percent. Assuming that 20 of these 50 new households choose to locate in Kalama, the population increase in Kalama would represent a 2.5 percent increase, which would not represent an adverse impact on population or housing demand in the area.

The PMEC would not displace any minority or low-income populations, or result in any disproportionately high and adverse effects on minority or low-income populations.

## **Property Values**

Because the PMEC site is located in the industrial zone, operational activities are not likely to adversely affect property values in residential and commercial areas of town.

## **Public Services and Utilities**

CCFD5 resources for fire protection and emergency services are adequate to serve the PMEC during construction and operation. Resources for technical rescues would be the first area needing attention, were additional resources needed (Leatzow 2006).

During operation, essential public services would be provided by on-site security personnel (Pacific Northwest Security), Cowlitz County Fire District No. 5, and County and city police departments. Emergency response plans would be implemented during operations to protect plant employees and structures in emergency situations (see Section 2.16, Security Concerns). Automated fire detection and suppression devices would be installed in the plant buildings to assist in the protection of employees and structures during fire emergencies.

Use of on-site services and emergency response plans and devices, coupled with the number of employees that would staff the facility (a total of 80 employees divided over two or three shifts), would not place an unacceptable additional demand on local public services.

Upon completion, the plant would be connected to the following established utility systems:

- Electric service: Cowlitz PUD;
- Natural Gas: Cascade Natural Gas (local) or Williams Pipeline;
- Sewer Services: Port of Kalama;
- Drinking Water: City of Kalama;
- Telephone: Kalama Telephone

Potable water would be supplied by the City of Kalama in distribution lines that have already been installed for the site. The plant would have negligible impacts on surface or ground water resources in the vicinity.

Process water would be supplied from the Port of Kalama. The PMEC would obtain water from existing wells owned and operated by the Port of Kalama, and would have an estimated peak instantaneous water demand of 5,826 gallons per minute (gpm). The total annual average demand used for design is 9,397 acre-feet per year or 5,826 gpm (for design planning purposes, the average demand was assumed to be the peak demand). Assuming that the Port succeeds in procuring the additional 15 million gallons of water per day that it has applied for, the Port can provide PMEC with sufficient water for any proposed water demand.

**TABLE 4.4-18  
ECONOMIC IMPACTS OF OPERATION**

Sector	Direct Effects		Indirect Effects		Induced Effects		Total Effects	
	Total Value Added (a)	Number of Jobs	Total Value Added (a)	Number of Jobs	Total Value Added (a)	Number of Jobs	Total Value Added (a)	Number of Jobs
Ag, Forestry, Fish & Hunting	-	-	0.0	-	0.0	0	0.0	0
Mining	-	-	0.0	-	0.0	-	0.0	-
Utilities	7.0	28	0.0	-	0.0	-	7.0	28
Construction	-	-	0.0	-	0.0	0	0.0	0
Manufacturing	-	-	0.0	-	0.0	1	0.0	1
Wholesale Trade	-	-	0.0	-	0.1	1	0.1	1
Transportation & Warehousing	-	-	0.0	0	0.0	1	0.0	1
Retail trade	-	-	0.0	-	0.3	7	0.3	7
Information	-	-	0.0	-	0.0	0	0.0	0
Finance & insurance	-	-	0.0	-	0.1	1	0.1	1
Real estate & rental	-	-	0.0	-	0.1	1	0.1	1
Professional- scientific/tech svcs	-	-	0.0	-	0.0	1	0.0	1
Management of companies	-	-	0.0	-	0.0	-	0.0	-
Administrative & waste services	-	-	0.0	-	0.0	1	0.0	1
Educational svcs	-	-	0.0	-	0.0	0	0.0	0
Health & social services	-	-	-	-	0.3	7	0.3	7
Arts- entertainment & recreation	-	-	0.0	-	0.0	1	0.0	1
Accommodation & food services	-	-	0.0	-	0.1	5	0.1	5
Other services	-	-	0.0	-	0.1	4	0.1	4
Government & non NAICs	-	-	0.0	-	0.3	1	0.3	1
Total (b)	7.0	28	0.0	0	1.6	29	8.6	58

(a) in millions of 2006 dollars

(b) totals may not add due to rounding

PMEC would be required to provide its own fire storage tank(s) since storage would not be provided by the City. Assuming adequately sized fire storage tanks and based on the estimated 20-year water demand forecasts, the PMEC facility would not have any negative impacts on the City of Kalama or Port of Kalama water supplies. Detailed discussions of water supply systems at the PMEC site and in the site vicinity, as well as PMEC-related impacts on these facilities, can be found in Section 2.5, Water Supply, and Section 3.3, Water. Operation of the proposed PMEC is not expected to have a significant adverse impact on existing public services or utilities in the PMEC vicinity.

The addition of potentially 20 new households could mean increased demand at Kalama School District or Kelso School District. Assuming every two households represent the addition of one school-age child, enrollment at either or both districts could increase by less than one percent, representing a less-than-significant impact.

There would be a potential positive impact on public services and utilities due to PMEC operation. The operational plant's assessed value would be over \$1 billion, and would generate several million dollars per year in generation, property and sales tax distribution to municipal, county and other local jurisdictions. A portion of these funds could be used to upgrade existing public services and utilities in the County. A economic development rule of thumb is that high value manufacturing or industrial development creates 1.5 times the capital investment ripple effect to the local economy.

#### **4.4.3. MITIGATION**

Socioeconomic impacts are expected to be beneficial in the form of additional jobs, increased sales, and increased tax revenues. Temporary increases in population due to worker relocation during construction are likely to be less than significant in view of the level of nearby urban development and abundance of transient accommodations available in the region. Specific mitigation measures to lessen the impacts of the construction phase on public service providers in the PMEC vicinity include the following:

- Construction activities would be coordinated with local police and fire departments, and emergency medical service providers to ensure access to all locations in the PMEC site vicinity and along the gas pipeline corridor in the case of an emergency.
- During construction, precautions would be taken to ensure that excavations do not damage underground utilities, including communications cables.
- To help mitigate loss of access and other traffic related impacts, adequate traffic control and signage, indicating closures and alternate routes, would be provided.
- Construction vehicle trips in and out of the immediate construction zone would be coordinated and scheduled away from peak travel periods, to minimize general traffic disruption.
- Noise and dust problems generated by construction would be mitigated through the use of properly muffled construction equipment, and by the use of approved dust control methods.

For related discussions of impacts and mitigation, see Section 3.2, Air Quality; Section 4.1, Environmental Health (Noise); and Section 4.3 Transportation.